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General Article

MASTITIS IN DAIRY CATTLE*

S. J. EDWARDS, B.SC., M.R.C.V.S.

HANNAH DAIRY RESEARCH INSTITUTE, AYR

Probably the most important disease of dairy cattle in so far as it affects economic dairying is that known as "mastitis" or "mammitis." Its importance lies not in its effect on the general health of the animal itself, which in the great majority of cases is negligible, but in its effect on the product of the mammary gland—the milk—which in its character and constitution is more or less seriously impaired.

The incidence of the disease is almost universal wherever dairying is conducted on a large commercial scale and the resulting losses are mainly due to the interference with the normal milk yield of affected animals and the consequent necessity of maintaining a larger number of cows. Figures relating to the prevalence of mastitis in different countries are available, and although it is difficult to form an accurate estimate of its incidence on account of the varying methods used in the detection of the disease it is clear that its distribution is widespread. Workers who have used reliable diagnostic methods on a sufficiently large scale have found that about 30 per cent. of all milking cows are affected with varying degrees of mastitis.

It has often been stated that further losses may arise from mastitis due to the unsuitability of affected milk for the manufacture of cheese and other milk products, but there is no reliable experimental evidence in support of this contention.

CAUSES

The term mastitis covers a number of distinct pathological conditions of the udder caused by different species of bacteria and the symptoms manifested will depend on the virulence of the invading organism. Thus, the condition so widely encountered in dairy cows, which is popularly termed "weed" in Scotland, is a chronic mastitis due to infection of the udder with streptococci which belong to a well defined group known as *Streptococcus agalactiæ* originally described by Nocard and Mollereau in 1887. On the other hand, the acute disease called in Scotland "udder-clap" or "garget" is caused by a diphtheroid organism termed *Bacillus pyogenes*. Apart from these two organisms, infections due to staphylococci, *Bact. coli* and other varieties of streptococci have been recorded, but they are comparatively rare.

Contributory Causes.—Whilst it has been conclusively demonstrated that the primary cause of mastitis is the invasion of the udder with certain pathogenic organisms, there is no doubt that several factors may be concerned in producing clinical symptoms of the disease. The influence of such factors will be mentioned later, but at this point it may be noted that they include improper milking, overstocking, and injuries of the udder. The extent to which improper feeding may influence the onset of the disease has not yet been fully investigated.

One practice which has frequently been blamed for causing mastitis is the use of milking machines. While it appears that in certain herds this may have been a contributory factor, it cannot be stated that the general incidence of infection in herds where milking machines are in regular use is significantly higher than in herds where hand milking is practised. Occasionally it is found that an increased incidence of the disease occurs in herds just after a change has been made from hand to machine milking, but this cannot be attributed to any inherent difference between the two methods of milking. It seems rather to be due to an initial lack of experience in the use of milking-machines resulting in improper or incomplete milking—one of the contributory factors already mentioned. If such faulty methods are employed in a herd in which there are already a number of chronically infected animals, the number of clinical cases is likely to show an increase. From evidence obtained in herds in which measures for the control of mastitis have been in practice and in which milking machines have been properly used, it can be said that no ill-effects have followed.

PATHOGENESIS

Numerous attempts have been made to induce mastitis by the feeding of pure cultures or mastitis milk, but they have been uniformly unsuccessful; similarly subcutaneous or intravenous injections have also been unavailing. The disease has been induced by smearing the teats with a culture of streptococci and there is evidence to show that infection takes place more readily when there is an associated wound

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or fissure of the teat. The disease can be most readily brought about by injecting culture into the teat canal.

It is now generally agreed that chronic mastitis is transmitted from one cow to another by the milker's hands during milking. Thus Seelemann and Siemonsen (1932. *Arch. wiss. prakt. Tierhlk.* **65.** 522) were able to transmit the disease by wet milking to three cows out of a total of eleven. Klimmer and Haupt (1933. *Tierärtzl. Rundsch.* **39.** 91) found that after a comparatively short time it was possible to infect healthy udders with streptococcus mastitis by milking with hands moistened with a suspension of a serum agar culture of streptococci. They were also successful in bringing about mastitis by rubbing the teat orifice, after milking, with the hand moistened with milk containing streptococci. Experiments in Denmark carried out by Bendixen (1934. *Medlemsbl. danske Dyrlaege.*, **17,** 480, 495, 527) have proved unmistakably the great importance in pathogenesis of injuries to the teats. The general view that *Str. agalactiæ* is feebly resistant to conditions outside the udder also suggests that direct transmission is necessary.

With summer mastitis it is thought that infection takes place by the teat canal or by contamination of surface wounds by flies.

Symptoms

Chronic Mastitis.—The symptoms are, as a rule, mild in nature and for a long period there may be no clinical sign of the disease either in the udder or in the milk. The first clinical sign of chronic mastitis is usually the appearance of a small clot in the fore milk of one or more quarters. The disease may not be noticed until the cow commences to dry off. While milking is carried out efficiently twice each day the streptococci are unable to multiply to any considerable extent, but at the end of lactation the milk is necessarily left for longer periods in the udder, the amount secreted is getting less and less, and a greater opportunity is thus afforded for the infection to alter the character of the milk. The milk from a practically dry cow is a thick viscous fluid, but, under normal conditions, it should be quite free from clotted material. In infected cows the secretion tends to take on the character of a thick yellowish clotted material.

Usually infection is carried over from one lactation to another so that at the beginning of the next lactation, the milk of the previously affected quarter may still be altered and the quarter may show considerable swelling. The symptoms may pass off in a few days with regular milking. Sooner or later, however, the symptoms reappear and owing to the constant damage inflicted on the udder tissues the quantity of milk is gradually reduced, the quarter appears smaller and harder than the normal quarters and eventually a permanent "light quarter" is established.

It may be noted that chronic mastitis is increasingly found in cows from their second lactation onwards, heifers when newly calved usually being quite free from disease. It may be assumed from this fact that a cow must be in contact with infection for a considerable time before the disease becomes established. There appears to be some evidence that certain cows are more susceptible to streptococcus mastitis than others, and the most reasonable explanation for this is that the conformation of the teat opening is such as to favour the easy access of organisms. The great importance of injuries at the teat orifice, however, should again be emphasised.

Summer Mastitis.—This disease, which is sometimes referred to as "udder-clap" or "garget," is quite distinct from chronic mastitis. It is an acute disease affecting principally cows which are being pastured during the summer months, although heifers are occasionally attacked. In summer mastitis the onset of the disease is quite obvious, the affected quarter being considerably swollen, painful and hard, and systemic symptoms may be present. The secretion from the affected quarter is a foul-smelling greenish-yellow clotted material and frequently blood is present. Owing to the fact that the disease is of definite seasonal occurrence coinciding with the appearance of flies, it is presumed that the latter are responsible for carrying infection. *B. pyogenes* is commonly associated with other abscess conditions in animals and there is usually a good opportunity for flies to find a source from which to spread infection.

The course of summer mastitis is as a rule not favourable and the tissues of the affected quarter are often completely destroyed. The losses due to the disease are on the whole not so serious as those caused by chronic mastitis, but they appear to be particularly heavy in some farms and in certain years.

Preventive Measures

Special attention will be given to preventive measures, since the restoration to a healthy state of an udder in which inflammatory changes have been provoked is extremely difficult. Although mastitis of the chronic variety is a contagious disease, the methods by which dissemination takes place are strictly limited, and for this reason its control presents a somewhat simpler problem than that of tuberculosis or contagious abortion.

Chronic Mastitis.—In describing the course of this disease particular stress was attached to the fact that a cow may fail to show clinical signs of infection, and yet be a carrier of the disease, *i.e.*, its udder and milk may be perfectly normal and yet infective organisms may be

present in the milk. *It is essential to realise that such a cow is just as important in spreading the disease as one which is showing definite signs of infection.* The problem of prevention, therefore, resolves itself into the detection of carrier animals and their isolation from clean stock. Infected animals may be allowed to stand in the same byre as healthy animals, but it is convenient to place them together at one end of the byre where they should be milked last. The separation of clean from infected stock will ensure that any possible errors in the order of milking will be avoided.

What, then, is the most reliable method of determining whether an animal is a carrier of infection? During recent years extensive investigations have been made with the object of devising a reliable test for this purpose. The final criterion of infection is the isolation and identification of the causal organisms from the milk. By the use of selective culture media in which samples of the milk are plated out, it is possible to differentiate the various types of colonies produced and to detect fairly readily those of *Str. agalactiæ*.

While the cultural test may be regarded as the only sure means of diagnosis, there are a number of supplementary tests some of which are quite useful and are easily available for use on the farm. Quite a sound practice is to milk the first stream from the quarters of each cow into a plate or sieve with blackened surface and to look for the presence of small clots. In addition, the milk from each quarter may be tested with brom-cresol-purple papers. The milk from a diseased quarter is sometimes abnormally alkaline and this can be shown by the colour which it imparts to a paper dipped into the fore-milk and allowed to dry. With a little experience, it will be appreciated that the milk from a healthy quarter, such as that from a first-calved heifer, gives a greyish colour with the yellow indicator in the paper, whereas that from a diseased quarter gives a purple colour. This test, like all those which are dependent on chemical changes in the milk, is only reliable when applied *to cows in full milk*, and is likely to be erroneous when applied to drying cows, whose milk normally gives a purple reaction.

All animals which either show the presence of *Str. agalactiæ* in the milk, or show abnormalities by the tests described, should be carefully milked after the clean stock. It has been stated that chronic mastitis more commonly attacks older cows, and that heifers are usually free. Quite a good plan, therefore, is to arrange the cows in the byre according to their ages and to milk the younger animals first.

In addition to these simple isolation procedures, general precautions of cleanliness should be observed in the byre. Cloths used for washing udders of cows which either have suffered from mastitis or been found to be carriers should not be used on healthy cows. To the water used for washing purposes may be added a mild antiseptic such as potassium permanganate. A very useful additional precaution is to wipe the cow's teats with this solution *after* every milking. This tends to prevent the possibility of organisms multiplying in the moisture left on the teat end after milking, and later gaining access to the udder. Wounds and fissures of the teat should receive special care and should be treated regularly. It is particularly important that cows with fresh wounds should be milked separately with clean hands. If milking machines are in use, a separate unit should be kept for the infected cows. Such cows should receive particular attention at the approach of drying, which should be allowed to take place gradually.

Minett, Stableforth and Edwards (1933, *J. Comp. Path. & Therap.* **46.** 131) made periodic observations over a five years' period in a practically self-contained herd consisting of 53 cows, of which in June, 1928, ten were affected with chronic streptococcus mastitis: two others were added during 1929. Preventive measures, in which the infected cows were simply milked last during the first two years, and subsequently kept in separated premises, led to the formation of a group of cows whose udders for over three years remained free from the streptococci of chronic mastitis.

Recently, evidence from the control of six other herds has been published by the same authors (Stableforth, A. W., Edwards, S. J., and Minett, F. C., 1935, *J. Comp. Path. & Therap.* **48.** 300). In one Friesian herd (1) where the original incidence was 55 per cent. periodic bacteriological examinations of the milk of individual animals have failed to reveal any as infected during the past three years. In this herd, control was assisted by the decision of the owner to dispose of infected cows. In three others (Herds C, J and K) in which the original incidence was 40, 30 and 53 per cent. respectively, the number of new infections has decreased during four to five years to 9·3, 7 and 7·8 per cent. in 1935. Herd L, made up of newly-calved heifers, had remained free for two years at the time of the report. In herd A the incidence and number of new infections was at first low; the number of new infections discovered rose in 1932 (probably due to more rigorous methods of testing) but since then has steadily fallen to 5·3 per cent. in 1935. From these results the authors conclude that:—

"(1) Eradication of chronic streptococcus mastitis may be achieved under certain conditions by the simple expedient of segregating infected cows, or if that is not possible, by milking them last. The chances of success,

however, are greatly increased if infected cows can be removed within a reasonable time. When this cannot be done, infusion of the affected udder with a suitable bactericidal agent should prove a useful aid.

" (2) Experience has shown that the disease does not arise sporadically once all known sources of infection are removed. New infections must, therefore, be due to errors in milking or to deficiencies in methods of diagnosis.

" (3) The formation where possible of a separate heifer herd is a measure of the greatest value."

Summer Mastitis.—In this disease the important point, presumably, is to prevent the entrance of bacteria into the udder of the dry cow while out at grass. The most simple preparation for this purpose and one which appears to have given good results on farms where it has been constantly used, is a mixture of archangel tar and lard. The teats should be dressed with this preparation at weekly intervals. Heifers also should be treated with the same protective dressing. Collodion is also quite effective in sealing teats, but the seal does not last long. Probably the most effective way of sealing a teat is to inject a non-absorbable substance containing a suitable antiseptic directly into the teat canal.

Curative Measures

Numerous methods are in use for the treatment of udder diseases and while some, no doubt, help to alleviate the prominent symptoms, it is extremely questionable whether any of them are effective as permanent cures. In describing the course of chronic mastitis it was stated that after the disappearance of the first attack there was sooner or later a repetition of the same train of symptoms, probably in a more severe degree. This is due to the fact that although the obvious changes such as swelling of the udder and clotted milk have temporarily disappeared, the causal organism is still present. No cure, therefore, can claim to be effective unless it can completely eliminate from the udder all the organisms which are responsible for the disease.

Vaccines.—Many veterinary surgeons favour the use of vaccines and there is some evidence that in certain herds where the incidence of mastitis has been serious their use has restored to a state of normality the milk of cows affected with the disease. It is uncertain, however, whether such a practice can be regarded as bringing about a complete cure in the sense already discussed, since there are few cases on record where the results of vaccination have been checked by adequate laboratory examination of the milk. Seddon and Rose (1934. *Aust. Vet. J.* **10.** 3) employed killed vaccines in a herd of about 100 cows over a period of five years. The amount of obvious mastitis was reduced both in respect of numbers of cases and severity, but the incidence of streptococcus infection was unaltered. Steck (1935. Proceedings of the Twelfth International Veterinary Congress, New York) has recently reviewed the question and has concluded that there is no proof as to the utility of vaccines. Seelemann (1932. *Die Streptokokkeninfektionen des Euters.* M. and H. Schaper. Hanover) after fairly extensive trial concluded that vaccination was unsuccessful for prophylactic or curative purposes.

(b) *Chemotherapy.* — Recently considerable attention has been given to the value of injecting chemical substances in solution into the udder. Great care is necessary in the selection of the chemical for use, since the udder tissue is particularly susceptible to the introduction of foreign substances. There is evidence to show that in certain cases the use of udder injections is attended by considerable success and that a complete cure can apparently be brought about. If a cow during her lactation has shown any of the premonitory signs of mastitis, the treatment should be postponed until the drying stage, when conditions are more favourable for its action. In cases of acute mastitis where there are advanced changes, the treatment should begin at once, and be repeated until the milk and udder have returned to normal. The most successful results are obtained when the udder has not become indurated when it is consequently impossible for the solution to penetrate the deeper parts of the quarter.

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Discussion

Mr. G. A. Sangster (Dumfries), opened the discussion of the foregoing paper in the following terms:—

I feel it is presumptuous on my part to attempt to discuss this able paper, which is chiefly concerned with the specialised work of a bacteriologist and research officer.

Considered from an economic point of view, it will be agreed that mastitis is probably the most important disease of dairy cattle. I am surprised, however, that Mr. Edwards gives the incidence so high as 30 per cent. of all dairy cows. Personally, I should have put it at less than half that figure.

Although it is undesirable, I cannot think that milk from cows suffering from chronic mastitis can have any seriously detrimental effect on the process of manufacturing cheese. I have knowledge of one farm, where practically all the cows were affected with chronic mastitis, and where the milk was so changed that the farmer had to procure a special sieve with a large mesh; this milk was manufactured into

cheese and sold in the usual market—(in passing, I may state that this farm was not under my jurisdiction).

Definition.—Mastitis is surely an inflammatory lesion of the mammary gland and not "any pathological or diseased state"; for example, tumours and certain injuries are pathological conditions but could hardly come under the term mastitis.

Cause.—I would ask Mr. Edwards if it has been proved definitely that streptococci causing mastitis are harmless to the human subject—most of us suffer at times from throat infections and are not aware of the source of the infection. Topley and Wilson, in their book "The Principles of Bacteriology and Immunity" in the article on Mastitis in Cattle state (page 969): "It is of great economic importance, and may be associated with the spread of infection to those who consume milk from the infected cow."

I would ask the essayist if the medium used by him differentiates between the streptococci of mastitis and other strains of hæmolytic streptococci? If not, how does he differentiate? My reason for asking is as follows. In the *Journal of Pathology and Bacteriology,* Vol. 40, No. 2, Minett supports the work of P. R. Edwards and concludes that streptococci found in cow's milk are ordinarily sorbitol fermenters. In the *Bulletin of Hygiene,* September, 1935, there is an extract from a paper in the *Journal of Hygiene,* 1935, Vol. 35; this paper is by H. J. Gibson and R. O. Muir and is entitled "A Study of Streptococci from 50 Cases of Bovine Mastitis." Fifty-one recently isolated strains of streptococci from bovine mastitis were studied and sorbitol fermentation was found negative in a large proportion of the strains.

I understand that the sorbitol and trehalose tests are those that are mainly used in differentiating between human and bovine strains. If the work of Gibson and Muir is correct, the difficulty of deciding whether a strain is human or bovine is all important. May not some cases of chronic mastitis be due to infection from human sources?

Contributory Causes.—The management of the herd plays an important part here. The change of a dairyman is often observed to have a beneficial or detrimental effect on the prevalence of mastitis. The present-day milking machines in proper hands give excellent results, and are a great improvement on an indifferent milker.

Transmission.—The essayist has stated definitely that organisms of mastitis can enter the vessel only *via* the teat duct and are transmitted directly, but one form of mastitis often follows a metritis.

Has the causal organism of chronic mastitis ever been isolated from other parts of the cow's body, such as the uterus?

Mr. Edwards mentions milkers' hands and milking machines as responsible for transmitting the disease. I consider flies to be carriers of the chronic form of mastitis as well as of the so-called "summer weed" and this would appear to be borne out by the fact that more cases occur in summer than in winter, and the spread is more rapid in the infected herds.

Prevention.—I have been advising the use of potassium permanganate solution, 1 in 1,000, for years, to be used for hands and udders, but I often wonder if it is of any real value. From my own experience I would suggest that in a valuable herd, where only a few animals are affected, the affected animals should be disposed of; I have often advocated this procedure with apparent success.

Mention is made of experiments carried out in controlled herds, where in four to five years the incidence of new infections was reduced from 40, 30 and 53 per cent. to 9·3, 7 and 7·8 per cent. In properly controlled herds one would not expect new infections. Would not natural reduction of virulence account for this drop?

It is stated in the paper that "Experience has shown that the disease does not arise sporadically once all known sources of infection are removed. New infection must therefore be due to errors in milking or to deficiencies in methods of diagnosis." I cannot quite understand this statement, in view of what Mr. Edwards states as the methods of transmission. If new infection occurs due to errors of milking, from where does the causal organism come?

Prevention of Summer Mastitis.—A useful and easily applied dressing to keep flies off udders and teats is the old skin dressing—oil, spirits of tar and sulphur, applied fortnightly. It is a dangerous process to inject any substance into the teats of heifers; I have seen this done with disastrous results.

Mr. D. Campbell (Rutherglen) thanked the essayist for an exceptionally interesting paper. It was his opinion that bacteriological methods were essential for the control of mastitis. He would have liked to have heard more from the essayist about summer mastitis, especially as to what substances to inject into the teat canal to prevent the entrance of infection.

An instance in his own experience of the value of chemotherapy was, he thought, worth describing. Though no clinical signs of mastitis were present in the cows' udders, the bacteriologist of the dairy firm who purchased the milk reported enormously increased bacterial counts. He took samples from each cow and samples were found to contain streptococci; out of 33 cows 27 were affected. The healthy cows were assigned to a separate milker. The teats of all cows were disinfected before milking, and each cow received 5ii of formalin. The infected cows were irrigated with a solution of entozon. The immediate results were disconcerting inasmuch as the material withdrawn from the udders in many cases was mixed with blood clots. Each cow was irrigated twice and in four weeks the dairy bacteriologist reported

that the milk was normal. He would like to ask the essayist what was the effect of the injection of silver preparations.

Mr. W. Nairn (Blairgowrie) commented that Mr. Edwards had dealt with a most important subject; the incidence of mastitis in his (Mr. Nairn's) district was very heavy, causing the destruction of a considerable number of udders.

When in America he had spent an afternoon with Professor Udall, who believed in the importance of clinical examination and claimed that he could separate the cows as accurately as the bacteriologist. By clinical examination Professor Udall divided the cows into four groups and by segregation on this basis hoped to eliminate mastitis from the College herd at Ithaca.

The thoroughness of the steps taken to deal with mastitis in the States was striking. But though milk was obtainable from herds free from tuberculosis, contagious abortion and mastitis, the medical profession in New York insisted on pasteurisation.

Like Mr. Sangster, he sought further information as to the explanation of the high incidence of summer mastitis in animals, when the teat canal was closed. Though it was difficult to transmit the disease artificially, it appeared so easy for accidental infection to occur.

He asked if a high protein ration had any effect on the incidence of the disease; it seemed possible that a digestive disturbance might cause a flare-up of a case already infected. Continental workers fed high protein to increase the milk flow, and by frequent milking flushed out the udder.

It seemed that mastitis had been somewhat neglected by the profession in this country. Cordial thanks were due to Mr. Edwards for his valuable contribution to the study of the condition.

Mr. Campbell asked to what extent a systematic endeavour had been made by clinical examination alone to detect early streptococcal mastitis? How did the results of such examinations correspond with those resulting from bacteriological tests?

Mr. A. Brownlee (Edinburgh) said he was not satisfied that animals possessed no resistance to mastitis. Had Mr. Edwards ever examined the milk from all the animals for the presence of streptococci, then left the cows in the same position and after a period again examined the milks? This might prove whether some animals were resistant.

Mr. L. Robertson (Arbroath) described his experience with a pedigree herd of Jersey cows, in which there were odd cases of mastitis without any known source. Two cows were treated with autogenous vaccines without any result. He then tried manganese injections on these two cows and got good results. Why should manganese give results when the vaccines did not?

Professor W. M. Mitchell (Edinburgh) said he had been greatly struck by the demonstration given by Professor Udall, but, though Professor Udall appeared able to classify the cases he found, he wondered how many cows escaped detection in the early stages that would have been found if a bacteriological examination of the milk had been made.

It appeared to him that veterinary inspectors should have gathered a wealth of knowledge by their repeated clinical examination of cows' udders.

He asked what Mr. Edwards advocated should be done with the cow with a definite, hard nodule in the udder. In such a case were organisms shut in and could some extraneous factor convert these into a source of danger? Elimination of the infected cows from a milking herd seemed the only course. Segregation in the byre was not entirely satisfactory: the control of mastitis was an extraordinarily difficult task. There was some doubt about the effect of chemotherapy; there was always the fear, when injecting an udder, that things other than the dilute antiseptic solution might be carried through the teat canal.

He thanked Mr. Edwards for reopening the question of mastitis.

Mr. Nairn said Professor Udall had with him the laboratory report and checked it with his clinical findings.

Mr. J. N. Ritchie (Edinburgh) asked if Mr. Edwards had ever tested the milk from carrier cows and had found that the infection disappeared spontaneously. Though 30 per cent. of cows might be found to be harbouring the causal organism, that did not necessarily mean that 30 per cent. were suffering from mastitis. Extraneous causes might be required to excite the disease.

Major A. Spreull (Dundee) agreed that stock vaccines were valueless, but he thought autogenous vaccine might be of use. In one outbreak in his experience autogenous vaccines appeared to have been useful.

Mr. Sangster inquired if it was not possible to find early thickening of the teat duct. Would it not be a good plan to stop milking the affected quarter and allow it to go dry and atrophy?

Major J. G. McGregor (Stirling) suggested that the anatomy of the udder might be found to play a part in controlling the incidence of mastitis. He found that the proportion of "wrong" udders was higher in Friesian herds, and these were easily milked cows with slack teat sphincters. The condition of mastitis had been present for generations and saturation point had probably now been reached, since heifers were relatively immune. Probably 50 to 60 per cent. of adult cows would show evidence of mastitis bacteriologically. He had found the brom-cresol-purple test very useful, though it might miss some cases.

However pure the milk supply, it must often be grossly contaminated in passing through the consumer's mouth, and many cases of sore throat must be derived from the patients' own bad teeth; therefore the cow was not the culprit.

The President, in calling on Mr. Edwards to reply to the discussion, added his quota of thanks to Mr. Edwards for his valuable paper.

The Reply

Mr. Edwards, in his reply, stated that he was pleased to hear the discussion that had taken place.

Since a large percentage of bulk milk contained mastitis streptococci, it was surprising that there were not more outbreaks of sore throat in human beings if they were pathogenic to human beings. There was some direct evidence that mastitis streptococci were harmless to man.

In reply to the question as to whether it was possible to differentiate between the streptococcus found in human sore throat and bovine mastitis streptococci, he said that a distinction could be made by colonial growth in blood agar media, which was confirmed by serological and biochemical tests. The sorbitol-trehalose test was only applicable for differentiating actively hæmolytic streptococci of human source from similar organisms of animal source, including milk, and the test was not

intended for identifying *Str. agalactiæ*, which usually produced colonies with narrow hæmolytic zones in blood agar.

Early in their work at the Research Institute of the Royal Veterinary College, London, they had considered the possibility of the uterus harbouring the causal organism of mastitis, but they had failed to recover such organisms from this site.

He did not think it possible that thickening of the teat duct occurred sufficiently often to make that clinical sign of use in early diagnosis. They had explored the possibility of co-relating the clinical abnormalities in an udder with bacteriological examination of the milk, but they had not found such a close relationship as to merit its inclusion amongst the diagnostic tests for latent disease.

He knew of no evidence to suggest that it was possible for the mastitis streptococcus to be enclosed within a fibrous nodule, and then to break down and act as the source of another attack.

He failed to see how it could be economically sound deliberately to let an affected quarter go dry when by repeated milking it might be possible to keep it in secretion.

He had never obtained satisfactory results from the application of external seals to the teats of cows, but he had used a non-absorbable seal within the teat consisting of vaseline four parts, paraffin one part, entozon (1: 1,000); this was injected at a temperature slightly above body heat. He had only conducted a preliminary investigation but he had found that such a seal had remained within the teat for a sufficiently long time. On farms where this method had been tried there had been no cases of summer mastitis, though in previous years the disease had been present.

It appeared to him that drugs of the acridine series must be the best to inject into the udder for the treatment of streptococcus mastitis, particularly since they were not rendered less active in the presence of serum. Crystal violet, a member of a closely related series, in a concentration of 1: 100,000, inhibited *in vitro* the growth of the streptococci causing mastitis, so it would appear that acriflavine or entozon in a concentration of 1: 1,000 should be capable of destroying them. It was possible to demonstrate that a dye solution injected into the udder removed from a newly-killed cow penetrated the depths of the tissues if no induration was present.

While he was interested in Professor Udall's work, he was not favourably inclined towards it; he had never been able to develop the manual dexterity claimed by American workers for the detection of slight fibrosis of the udder. In any case, fibrosis, being a tissue change, must be secondary to invasion by streptococci.

He considered that the higher incidence of mastitis in the summer was due to the specific seasonal disease "summer mastitis." His own view was that infection entered by way of the teat canal and that flies might play a part in transmitting the infection, especially as they had free access to other sources of infection. On inquiry in farms where fly repellents had been applied to the teats it was found that the disease had been checked. It would be unwise to interfere with the teat seal of a heifer by trying to inject substances into the teat canal.

The cause of chronic mastitis was an organism which was transmissible during milking. He had been able to convince agriculturists, who thought that the disease was due to other factors, that the basis of its control must be on preventive lines.

He did not think that the failure of the disease to spread uniformly to all milking cows in the byre in some outbreaks could be held to be due to the possession of specific immunity. Mastitis was not comparable with those diseases caused by strongly invasive organisms which possessed the ability to penetrate the tissues and against which it was possible to provoke immunity—either naturally or artificially. Progress in the fight against mastitis had been delayed until the knowledge of its bacteriology and diagnosis in the latent stage had been advanced. While more attention might be given to vaccine therapy, before any progress could be made, a good deal of work would be needed in the selection of an antigen and if possible in endeavouring to enhance its activity.

He had no experience of colloidal manganese, but as it was possible to get superficially quite good results by repeated milking of an infected udder it might well be that manganese was given credit for which it was not entitled; the same remarks applied to the beneficial effect claimed for vaccines.

It was known that an animal might be a carrier of *Str. agalactiæ* for several lactations and it appeared that spontaneous recovery was rare.

He agreed that the incidence of mastitis was high in Friesians and this might be due to an anatomical predisposition of the mammary gland —being free milkers they had flaccid teat sphincters.

In conclusion, he wished to thank them for the discussion, from which he had learned a great deal, and also for the sustained interest they had displayed in the subject.

A NEW ESSENTIAL AMINO ACID

The interesting note printed below is reproduced from *Nature*, February 1st, 1936: "Attempts have repeatedly been made to study the physiological significance of individual amino acids by feeding experiments in which a known mixture of amino acids has been supplied in place of proteins. Such attempts have failed, and the existence of a protein growth-promoting component other than the 20 known amino acids was proved. The addition of a crude concentrate of the mono-amino acids to such a synthetic diet provided for satisfactory growth. The inference was that the missing growth essential was of a simple nature. This missing component has now been isolated and found to be, in fact, two acids (M. Womack and W. C. Rose, *J. Biol. Chem.*, 112. 275 (1935); R. H. McCoy, C. E. Meyer and W. C. Rose, *ibid*, 112, 283 (1935)). These have been separated by their solubility difference in aqueous butyl alcohol. The more soluble has been identified as isoleucine and the less soluble as one of the four optically active α-amino-β-hydroxy *n*-butyric acids. This acid has been isolated in a pure crystalline form, and several derivatives obtained. The importance of isoleucine had been recognised previously, but the amount present in the leucine of the amino acid mixture was insufficient for growth. Hydroxyaminobutyric acid has been described before as a hydrolytic product of proteins, but its essential character was not hitherto known. About 0·6 per cent. of this acid is the minimum amount for satisfactory growth of rats with an otherwise adequate diet."

The Veterinary Record
March 7th, 1936.

THE FORTHCOMING R.C.V.S. COUNCIL ELECTION

SOME of the candidates for election to the Council of the R.C.V.S. appear to be under a false impression as to the duties of that body; indeed, as the Council has no authority to interfere in matters relating to appointments, either whole-time or part-time, it would seem that these candidates are seeking election to the wrong body. It is the Council of the N.V.M.A. whose functions cover all such questions.

The duty of the Council, R.C.V.S., is settled by the Charters of the College and the Acts of Parliament. They are confined to the examination of students, and all matters connected therewith, including the nature and extent of the examination, the selection of examiners, the award of diplomas and the registration of members. The Act imposes on the Council the duty of keeping the official Register of Veterinary Surgeons, and of removing from the Register the names of members who have been guilty of conduct disgraceful in a professional respect.

Beyond this the Council has no other specified powers. The N.V.M.A., however, has been established under the Companies Acts with the following as its first object:—

> "The promotion and advancement of veterinary and allied sciences . . . . and to support and protect the character, status, interests, and honour of the veterinary profession."

Surely it is desirable that the Council of each of these two bodies should be recruited from those members whose experience is best suited to the duties to be carried out. The Council of the R.C.V.S. needs men who are specially interested in the academic side of the profession, the education and examination of students, and men of standing fitted to be judges of professional conduct. The Council of the N.V.M.A. requires men who are interested in the politics of the profession, in the safeguarding of the business interests of all sections of members.

Members seeking to serve the profession on either of the Councils, should decide what is their particular aim, and then allow themselves to be nominated for the appropriate Council.

* * * * *

THE AGRICULTURAL RESEARCH COUNCIL

THE profession will have been pleased to learn, as we announced in our issue of February 22nd, that a veterinarian has at last been appointed to the Agricultural Research Council. Mr. John Smith, *O.B.E.*, M.R.C.V.S., who was formerly Director of Animal Health in Northern Rhodesia, has been appointed and he will soon bring a wealth of experience in the tropics to bear upon the problems discussed by the Council. We feel certain that his advice will rapidly justify the appointment of a veterinary representative and that the Council will quickly realise that by strengthening itself with the addition of a veterinarian with tropical experience it has gained much, but that it may gain still further strength by an early addition of a veterinarian with rich experience of animal health in this country. At the moment, however, our readers will all desire to extend their best wishes to Mr. John Smith in his task of justifying the appointment of one of our colleagues to the Council and of preparing the way for others to follow him.

It will have been noted that, in the announcement by the Lord President of the Council in the House of Commons, the view was again expressed that "it is not desirable that professions as such should be represented on the Agricultural Research Council." Whilst we would agree with this, we are glad to note that the view that appeared to be held previously, namely, that no member of the veterinary profession may be appointed, has at last been discarded. Our profession has no wish for veterinary representation as such, but we expect experts in the various branches of veterinary science to be appointed to the Council just as one finds that many experts in medical science, including clinicians, are members of the Medical Research Council.

Clinical Communication

AN OUTBREAK OF INFECTIOUS CONJUNCTIVITIS AND DACRYOCYSTITIS IN TROOP PONIES

EDWARD F. PECK, B.V.Sc., M.R.C.V.S., D.T.V.M. (EDIN.)
Burao, British Somaliland

History.—Outbreaks of conjunctivitis have occurred amongst troop ponies in this country, which were characterised by being resistant to the usual methods of treatment.

Symptoms.—The disease commenced with a slight catarrhal discharge from the inner canthus of the eye, which was usually associated with chemosis and blepharœdema. This discharge quickly attracted flies and no doubt was the cause of dissemination. The lacrymal sac was swollen and hard, and examination of the distal end of the lacrymal canal revealed that it was dry and surrounded by a dirty discharge. There was considerable pruritus over the sac, and this in some instances was the cause of very severe injuries being inflicted on the pony when rubbing himself.

Treatment. — It was apparent that the blockage of the canal was the reason why medication of the eye had failed to effect a cure. Irrigation of the sac and canal was therefore carried out with a 1 : 1,000 aqueous solution of chinosol, or alternatively of acriflavine, *via* the distal orifice of the canal. For this purpose a 2-oz. syringe was used, and an ordinary 1·65 mm. blunt-pointed hypodermic needle was joined to it with a short length of rubber tubing. Invariably a plug of mucus, which was frequently bloodstained, was washed from the proximal end of the canal. Subsequent treatment consisted of similar irrigations of the eye twice daily and the application of ung. hydrarg. flav. to the eye. In addition, string eye shades were worn to give shade and prevent the spread of infection.

Prevention.—The use of eye shades, smoke fires, string eye shades when necessary, and discontinuance of the employment of eye sponges.

Discussion.—It is not always possible to irrigate the sac from the distal orifice of the canal, as in some ponies the canal has secondary openings along its course, the existence of which causes the return of the chinosol *via* the nostril; in such cases pressure over the sac may effect the expulsion of the mucous plug *via* the puncta.

In other cases it will be found that reasonable pressure with the syringe will not enable the chinosol to flow through the canal, but if the attempt to wash the canal is gently persisted in several successive times, free passage will quickly be effected.

It is hoped that these few notes on an old treatment will be of use to those who have found this condition resistant to medication.

Reports

THE BACTERIOLOGICAL GRADING OF MILK

(By G. S. Wilson, assisted by R. S. Twigg, R. C. Wright, C. B. Hendry, M. P. Cowell and I. Maier. [M.R.C. Sp. Report Series (1935) No. 206. 7s. 6d.])

The above report is an excellent and painstaking account of an enormous amount of detailed research work carried out during the last three years at the London School of Hygiene and Tropical Medicine. One can find nothing but praise both for the exact and critical methods employed and for the report, which gives in addition such an important account of the relevant literature. The preface contains the following extract which sets out the aims and limits of the enquiry: "Milk can be graded bacteriologically either with regard to the cleanliness and keeping quality, or with regard to its safety. The tests used in these two respects are fundamentally distinct: on the one hand they depend upon the relative abundance, in the sample, of the saprophytic bacteria which naturally occur in milk, and on the other upon the freedom of the milk from micro-organisms capable of giving rise to disease in human beings. In this report attention is given solely to the bacteriological methods available for determining cleanliness and keeping quality: the safety of the milk, as shown by the absence of pathogenic organisms, is not discussed."

The two methods which have hitherto been mainly used in grading milk for cleanliness are the plate count and the coliform count. It is shown that both methods have a large experimental error, and the plate count in particular gives an appearance of accuracy which is fictitious and misleading. Under the heading of the plate count, evidence is brought to show the difficulties of obtaining homogenous samples of milk for testing. Both æration and shaking appear to lead to an increase in the plate count; it is recommended, therefore, that sample bottles should be filled to the neck. Samples should be taken and kept at atmospheric temperature till a specified time, such as twelve hours after milking for the morning's milk and 18 hours after milking for the evening's milk, after which they should be examined

at once or transferred to the refrigerator, and kept there till examined. Further, samples taken whilst the milk is in the hands of the distributor should be cooled at once to maintain the bacterial population in the *status quo*. Owing to the complex nature of the milk flora, it is impossible to devise a medium which would be favourable under any given set of conditions for the development of all organisms. Variations of temperature even in the same incubator, the difficulty of counting plates containing many colonies at about the limit of resolution of the naked eye, the differences due to personal bias, the sampling error, and the differences in the working accuracy of different observers all tend to produce errors of considerable magnitude. Ostensibly the plate count measures the numbers of bacteria in milk, but actually it does not. Often a large proportion of the bacteria present are dead, whilst those that are alive differ in their nutritional and temperature requirements. Many of the bacteria are distributed not individually, but in chains or groups of varying sizes. The colonies on the plates are derived, therefore, not solely from individual organisms but also from aggregates containing various numbers of organisms. These aggregates may disintegrate to a variable and quite uncontrollable extent during the process of dilution, leading to enormous errors. Not only are the results inaccurate, not comparable from milk to milk, but as the results are expressed quantitatively in figures, they afford a fictitious appearance of accuracy which leads to an unjustifiable feeling of confidence in their value. The technique is complex, and extremely difficut to standardise and it is, therefore, recommended that the plate count test should be discontinued as a method of grading ordinary raw milk.

Four methods are described for the quantitative estimation of *coli ærogenes* bacilli in milk. They are:—

(i) A dilution method, followed by plating and differentiation of the individual colonies;

(ii) a direct plate count on McConkey's agar at 37°C. and 44°C, the latter temperature giving the number of organisms of the fæcal type of *coli* only;

(iii) the ordinary dilution method modified by incubating a double set of McConkey broth tubes, one at 37°C. and one at 44°C., the latter estimating the fæcal *coli* type;

(iv) similar to method (iii) but only one set of tubes is set up and incubated at 37°C., all positive tubes being sub-cultured into Koser's citrate at 37°C. and McConkey's broth at 44°C. The presumptive coliform count is estimated from the McConkey's broths at 37°C., the fæcal *coli* from the McConkey's broth tubes at 44°C. and the *ærogenes-cloacæ*-intermediate forms from the positive citrate tubes at 37°C.

Whatever test is employed, the figures obtained are only approximate, since the dilution method is attended by a high experimental error, particularly as clumping of the bacteria may have occurred. There appears to be no really accurate method for determining the numbers of coliform bacteria in any fluid material, and, therefore, should the test be used for grading milk, it is recommended that attention should be concentrated on ascertaining whether coliform bacilli are present in numbers exceeding or falling short of an agreed arbitrary number, and the report should then be issued as "above standard" or "below standard."

A large part of the report is given over to the methylene blue reduction test and a modified method is recommended. The methylene blue solution is prepared from tablets, one tablet being dissolved in 200 ml. of warm sterile distilled water, which, after cooling, is made up to 800 ml. One ml. of this solution is added to 10 ml. of milk (giving a concentration of approximately 1:300,000). Each tube of the mixture is then fitted with a sterile rubber cork and slowly inverted once, after which it is placed in a water bath—for raw milk the temperature should be 37°C. to 38°C., whilst for pasteurised milk an additional bath at 55°C. or 63°C. may be necessary. At half-hourly intervals the tubes are inverted once, the colour of the milk being noted before inversion. This method enables the fat and micro-organisms to be in a more or less homogeneous state of dispersion. Milk referred to as "sterile" was collected under aseptic precautions from a single healthy quarter of the udder of a cow and had a plate count on milk agar at 37°C. of 10 to 100 per ml. and although it is possible to demonstrate that such "sterile" raw milk contains a natural reducing system independent of any bacteria that may be present, under ærobic conditions it is completely unable by itself to reduce methylene blue. Leucocytes tend to increase the reducing activity of milk, but unless they are present in very large numbers they are unlikely to lead to the reduction of methylene blue under ærobic conditions unless accompanied by micro-organisms. The end point of the test is taken when the dye is completely decolorised, or decolorised up to within 5 mm. of the surface, and the reduction time affords a very fair index of the cleanliness of production and of the keeping quality of the milk. The test is probably not reliable for the examination of milk of individual cows, but appears to be well adapted for the examination of all raw milk. It is a simple, inexpensive test, with a small experimental error, it does not appear to be seriously affected by the degree of aggregation of bacteria in the milk, and is a much more sensitive method of estimating the

presence and growth of bacteria than is the plate count. It seems fitted, therefore, for gauging the keeping quality of milk and the grading of raw milk. It is desirable, however, that frequent examinations—weekly or fortnightly—of the raw milk of individual producers be carried out and that a given proportion, for example, 75 per cent., of the samples throughout the year should reach the required standard. As the report is mainly concerned with principles, only suggestions for the times of reduction are mentioned. It is suggested that all liquid milk for human consumption should reach a standard corresponding approximately to that which was laid down for Grade "A" milk. Therefore, 75 per cent. of samples of morning milk from any given farmer, left at atmospheric temperature for twelve hours and subsequently refrigerated overnight, should have a reduction time of over five-and-a-half hours in the summer and over six-and-a-half hours in the winter. The same standard should apply to the evening milk left at atmospheric temperature for 18 hours and examined directly.

Consideration is also given in the report to other tests, *e.g.*, the sediment test, the leucocyte count, the titratable acidity, etc., but none is considered suitable for the routine grading of milk. The Breed smear method, although less suitable than the modified methylene blue reduction test, would be of value to farm inspectors because it enables a distinction to be drawn rapidly between clean and dirty milk and consequently between the various faults of production to which any given milk is subject.

R. L.

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AN INQUIRY INTO THE DESIGN, OPERATION AND EFFICIENCY OF PASTEURISING PLANTS

(By A. W. Scott and N. C. Wright. [Hannah Dairy Research Institute Bulletin. (1935.) No. 6. pp. 72.])

This bulletin consists of the results of an inquiry undertaken as a sequence to an earlier inquiry in Scotland into the existence of tuberculous infection in milk.* The earlier report showed that among milks which had been pasteurised according to the accepted standards laid down under the Milk (Special Designations) Order (*i.e.*, at a temperature of 145° to 150°F. for 30 minutes), samples showing living tubercle bacilli could be recovered afterwards. Faulty design and/or operation of the plants concerned was suspected. Some 19 pasteurising plants in Edinburgh, Glasgow, Dundee and Aberdeen were examined during working conditions by the two investigators; numerous measurements, readings, etc., were taken, and samples of the milk were submitted to bacteriological examination at different stages of the process.

Much of the report deals with the more purely technical points in actual processing under the following headings: weighing and receiving the incoming raw milk; initiating milk circulation; filtering or clarifying; heating to pasteurising temperature; holding; cooling and bottling.

Among several criticisms made during the earlier stages, the following may be noted. Some firms use copper gauze strainers, and it is pointed out that copper, instead of being chemically inert in the presence of milk of a general average *p*H of about 6·5 and at a temperature of 150°F., imparts a taste described as "oily" to the milk. Some receiving tanks were situated close to the open street, and, not being provided with covers, were liable to casual contamination with extraneous matters. In the discussion of methods of filtering or clarifying it is emphasised that some preliminary method of filtering is absolutely essential, and that it should take place at as low a temperature as possible. Opinions vary as to whether cloth filtering through a cotton cloth with a nap or centrifugal bowl filtering is the better. A table is given to illustrate the inferiority of hand control of the steam supply for heating the milk in comparison with thermostatic control. Temperatures varying between 132°F. and 156°F. were recorded in some plants where steam kettle heaters were controlled by hand.

In the various types of holder tanks inspected, a common fault was a "dead space" at the bottom near the outlet valve, which, not being surrounded by the heated jacket, was liable to contain milk of a temperature lower than would ensure pasteurising. Thus different samples of milk from these "dead spaces" ranged up to 11°F. below the milk temperature in different plants. The possibility of forward leakage by inlet valves was examined and different types are discussed. Some remarkable discrepancies are reported in the differences between recorded temperatures and the true temperatures taken by N.P.L. standard instruments. Thus thermometers were found to vary between −1·0°F. and +6·2°F., while thermographs differed by −6·0°F. and +5·0°F. It is emphasised that there is a great need for constant supervision and checking of heat recording instruments. The results of registering temperatures in the holder tanks showed that in four plants examined the temperatures rose above the legal 150°F., and in six were below 145°F. The time of holding was found in certain plants to be below the 30 minutes required, and it is stressed that more care should be given to this

* Tuberculosis Infection in Milk. A Report by the Department of Health for Scotland. *Med. Res. Counc. Sp. Rept. Ser.* No. 189.

aspect of the question by the designers of pasteurising plants. Methods for cooling the pasteurised milk down to below 50°F. were found to be generally satisfactory, but several plants were open to the serious objection that the milk might readily be contaminated by atmospheric contaminants—dust, flies, splashes, and infection from coughing, etc., by operatives. In water used to rinse the cooling surfaces, cultural examination showed that by plate counts four plants gave results of over 40,000 organisms per ml. and all showed coliform organisms present in 1 ml. (In one case the number of organisms is described as "uncountable.") The degrees of contamination which might exist in the bottles used for the milk receive careful attention. Some washed bottles from all plants were found to contain organisms; 4·9 per cent. of the bottles containing more than 10,000 organisms per ml.

In the portion of the report devoted to bacteriological control, it is shown that pasteurising can be relied upon to safeguard the customer from pathogenic organisms if the processes are carefully carried out, but that through faulty design or inefficient operation, many "pasteurised" milks may contain harmful organisms. Various other factors may contribute to this contamination of pasteurised milk. Especially important are the methods of production. In this connection parts of a quotation are worth giving here: "More careful methods in the production and handling of milk . . . resulted in . . . higher pasteurisation efficiencies, so that counts on the pasteurised milk were markedly decreased."

The summary of the gross reduction in counts between the results of the raw milk as received and those of the milk after bottling shows that this varies between 55·7 per cent. and 99·9 per cent., with the greater number of tests approximating the latter figure. So far as the tuberculosis organism is concerned, it is pointed out that in the earlier report referred to, 33 positive samples were found among 1,092 pasteurised milks examined. The authors of the present report found in efficiently run and highly satisfactory plants no positive results for the *M. tuberculosis* in 340 samples examined, but in poorly operated plants eleven positives amongst 332 samples.

The report ends with a description of the phosphatase test and a short account of the various materials used in pasteurising plants. It can be recommended to those whose work brings them into contact with milk production or who are interested in the wider question of "pasteurised" *versus* "tubercle-free" raw milk. It is perhaps especially opportune at present, in view of the recent announcement of the changes provided for by the Draft Milk (Special Designations) Order, 1936.

Abstracts

[A Case of Prolapse of the Bladder in a Mare. (Trans. title.) Cocu. (1935.) *Bull. Acad. vét. France.* **8.** 2. 153-157.]

About a week after parturition a mare showed incontinence of urine and a tumour-like mass at the vulva. Palpation revealed this to be the prolapsed bladder (mucous membrane covering, absence of urethral opening in the vagina and presence of the paired ureteral openings on the upper surface of the prolapsed organ. Cocu draws special attention to the fact that in this condition the ureteral openings have a sudden kink in the thickness of the bladder wall and as a result the urine which escapes from them does so in a forward direction relative to the roof of the vagina.

Attempts to reduce the prolapse, starting at the free extremity, failed, but by commencing at the neck and by using a pliable rod-like instrument ending in a smooth rubber cap, which served to retain the organ by being pushed gradually along the reconstituted urethra as reduction proceeded, the prolapse was reduced.

It soon became prolapsed again, however, owing to the flaccidity of the walls, so before replacing it again the organ was massaged for 15 minutes in the vagina. Muscular tone was recovered and after a second reduction there was no recurrence of prolapse.

J. E.

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[The Effects of Ovariectomy on the Genital Tract of Cats and Dogs affected with Chronic Endometritis. (Trans. title.) Lesbouyries and Berthelon. (1935.) *Bull. Acad. vét. France.* **8.** 5. 257-265.]

The authors give a dozen case records of pyometra in bitches and cats in which they performed ovariectomy as the only or main treatment. In most cases the operation resulted in the rapid evacuation of the pus, with complete cessation of discharge in two or three weeks. In some cases the ovaries appeared normal, in some they showed cysts and in some there were corpora lutea. Some cases recovered and remained well, some showed œstrum or nymphomania afterwards, whilst others ceased to do so and in a few cases there was a relapse in the condition of the uterus, *i.e.*, a return of endometritis with accumulation of pus. Two such cases, on re-operation, showed cysts at the apices of the uterine horns, but whether these actually originated from fragments of ovary left behind is not clear. Moreover, the data given do not suffice to enable one to formulate a good theory of the origin of these variable results.

J. E.

[Rectal Exploration in Veterinary Medicine. (Trans title.) Duhaut, R. (1934.) *Rev. gén. Méd. vét.* **43.** 513-525.]

This is not an exhaustive anatomical treatise but a clinical discussion of certain important uses of rectal exploration in cattle and horse practice.

Cattle. (1) *Genital System.*—Pregnancy and sterility are discussed, the use of rectal examination in diagnosing the period of gestation being described. Enlargement of the uterus can first be determined at about six weeks after conception. The fœtus can be felt between the third and sixth month, when it sinks out of reach low in the abdomen: it approaches the pelvis again soon after the seventh month. The use of rectal exploration in diseases of the ovary and uterus causing sterility is next dealt with. [Presumably, this is well known: *vide* observations by Tutt, Quinlan, *et al.*]

(2) *Urinary System.*—The kidneys, ureters and bladder can all be felt *per rectum*. Calculi of the bladder are much more easily felt if the bladder contains some urine than if the organ is empty. A case of obstruction of the left ureter just above the bladder is described. The distended ureter was massaged in a downward direction and the obstruction, composed of soft material, was successfully removed.

(3) *Alimentary System.*—An unusual condition—a combined torsion of the uterus with intestine—is described: in the author's experience this condition has always proved fatal. Pelvic hernia in bullocks and fractures of the lumbar and sacral vertebræ are also dealt with.

[The author proceeds to discuss the uses of rectal exploration in the horse, but a mere mention is made of the anterior mesenteric artery in this connection, and nothing is added to the information contained in H. Caulton Reeks' book on Colic.]

J. E.

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[Inapparent (Subclinical) Infection of the Rat with Louping-Ill Virus. Burnett, F. M. (1936.) *J. Path. & Bact.* **42.** 1. 213-225.]

The work was undertaken as an approach to the study of poliomyelitis in the human subject to determine (1) the mode of entry of the virus into the body and the route followed thereafter to the anterior horn cells of the spinal cord; (2) the nature of the virus-inactivating bodies present in adult human serum.

The lack of suitable experimental animals led the author to study the effect of louping-ill virus in rats as an analogous condition to the suspected subclinical infections to which he attributes the immunity of adults.

Intracerebral inoculation of rats with louping-ill virus does not lead to infection but intranasal inoculation results in a subclinical infection, there being no symptoms and no significant rise in temperature, but virus is demonstrable, by intracerebral inoculation of mice, in the olfactory bulbs. Positive results are usually obtained up to the eighth day, after which virus disappears from the blood concurrently with the appearance of virus-inactivating bodies in the serum, the latter being demonstrated by the egg membrane technique. Sufficient immunity is produced to prevent multiplication of virus in the olfactory bulbs following a second inoculation intranasally. Other routes of inoculation also resulted in localisation of the virus in the olfactory bulbs.

A convenient abnormality in the stock of rats used—whereby on one side, the nasal mucosa showed deficient pigmentation, absence of nerve fibres and atrophic olfactory bulb—lent support to the theory that the virus travels along the neurons, as it was found that the virus was not present on this abnormal side but was so on the normal.

The recognition of these subclinical infections in rats leads the author to suggest that *post-mortem* examination of the olfactory bulbs of children dying of other diseases during a period of prevalence of poliomyelitis might reveal a similar condition.

J. W. M.

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[Infection of the Rhesus Monkey (Macaca mulatta) and the Guinea-pig with Virus of Equine Encephalomyelitis. Hurst, E. W. (1936.) *J. Path. & Bact.* **42.** 1. 271-302.]

The experiments described were undertaken to investigate both the Eastern and Western strains of the virus of equine encephalomyelitis which is regarded as a typical neurotropic virus, and is useful in that the monkey and guinea-pig are convenient experimental animals, reacting rather similarly to the horse affected with the natural disease.

In monkeys, intracerebral inoculation is always fatal, but infection by other routes may lead to either (1) a subclinical infection without symptoms and with no significant rise in temperature, but resulting in a definite immunity; or (2) a second type in which nervous symptoms arise after a lag period of three to nine days, and advance to complete prostration. No relation could be found between route or dose and the resulting type of infection.

After peripheral inoculation virus appears in the blood but tissue extract inoculations tend to show that virus does not occur elsewhere. The increased concentration of virus in the blood indicates actual proliferation of virus in the blood or in some portion of the tissues in close contact with the blood, *e.g.*, the blood vascular endothelium system. The virus disappears from the blood about the same time as the appearance of antibodies is noted, and is usually completely absent before nervous symptoms

arise. The occurrence of virus in the lumbar region of the cord after its appearance in the higher regions, even in cases of intramuscular inoculation in the thigh, is regarded as proof that neural spread is not direct. The immunity resulting from subclinical cases is not complete as intracerebral inoculation is still usually fatal but intramuscular inoculation is generally resisted.

In guinea-pigs these two types of the disease are not distinct but tend to overlap. Some differentiation between Eastern and Western strains is possible in this animal, in regard to speed of reaction and mortality. True subclinical cases are rare, but recovery is accompanied by immunity which resists intracerebral inoculation except for a rise in temperature. Local proliferation of virus was not found except in the case of the pads. Histological findings and the results of some surgical experiments indicated that passage of virus from the blood to the brain is by way of the nasal mucosa and thence by the perineural lymphatics in the case of intranasal inoculation, but in other routes the spread is through what is referred to as "a method of growth through" the hæmato-encephalic barrier, since in nervous disease the concentration of virus in the central nervous system is high but there is no virus in the blood, while antibodies may be demonstrated in the latter.

Comparison with the viruses of vesicular stomatitis, yellow fever and louping-ill leads the author to suggest that they should be grouped as a separate class of neurotropic viruses.

J. W. M.

H.M. STATIONERY OFFICE PUBLICATIONS

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House of Commons Bills (Session 1935-36):—				
57. Milk (Extension of Temporary Provisions) ...	0	2	0	2½
Statutory Rules and Orders, 1936:—				
71. Animal. Diseases of Animals. The Warble-fly (Dressing of Cattle) Order, dated January 31st, 1936	0	1	0	1½

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Issue of the supplementary civil estimates reveals that of the £101,000 required by the Ministry of Agriculture and Fisheries £53,000 comes under the heading of grants in connection with diseases of animals, and is made up of £45,000 for foot-and-mouth disease, etc., and £8,000 for swine fever.

"VETERINARY MILITARY HISTORY OF THE UNITED STATES"

(*By* LOUIS A. MERILLAT, Lieut.-Colonel Veterinary Reserve, Chief Veterinarian, First Army, American Expeditionary Force; and DELVIN M. CAMPBELL, Lieut. - Colonel, Veterinary Reserve, Editor, *Veterinary Medicine*)

[Reviewed by Major-General Sir John Moore, K.C.M.G., C.B., F.R.C.V.S.]

(*Concluded*: *The earlier sections of this Notice appeared in our issues of February 22nd and 29th, pp. 221-229 and 245-254 respectively.—Editor.*)

Chapter LII.—Veterinary Service with the Field Artillery of the American Expeditionary Forces

Perhaps no branch of the service during the World War had greater need of horse flesh than did the field artillery. Under the demands of hard campaigning, man and horse suffered alike, but men were replaceable; horses and mules were almost impossible to obtain. Hence it was necessary to conserve horse flesh to the utmost. To this end veterinary officers with the field artillery were required to exercise constant vigilance, high professional skill, sound judgment and a rigid devotion to duty. Hauling ammunition almost nightly over muddy fields and roads knee-deep in mud, sapped the vitality of horses and mules, already suffering from malnutrition and debility. Constant exposure to shell fire, bombing, gas attacks, and even machine-gun and rifle fire took its toll from the nervous system of the horse as well as from that of man. It is small wonder that casualties were heavy, and that evacuations of animals because of emaciation and debility mounted as units fought on and on without rest during the summer and fall of 1918.

A point dealt with in this chapter concerns the policy of promotion of veterinary officers in the A.E.F. The lack of suitable rank was always a serious handicap in dealing with battery commanders, although regimental commanders were usually very sympathetic towards the efforts of veterinary officers to improve conditions among animals in their units. Efficiency could have been increased tremendously had veterinary officers with front line units been given rank commensurate with their duties and responsibilities. Unfortunately the whole question of promotions seemed to be tied up intimately with the school from which an officer graduated; those who were fortunate enough to come from favoured schools seemingly had no trouble in securing promotion. This policy, which seemed to extend even to the A.E.F., was one of the most unfortunate things

connected with the Veterinary Corps during the World War. Many features of the Veterinary Corps and the remount service in the A.E.F. were ghastly mistakes. Let us hope that these mistakes will never be repeated.

Chapter LIII.—Hospitalisation of Animals

The Veterinary Corps may be proud of the hospitals established overseas. They were well commanded and in spite of shortage of equipment and supplies during the critical period, their intra-mural management was exceedingly creditable. The difficulty of getting animals to them, and their insufficient capacity, was no fault of their commanders. The first veterinary hospital to be established was at Neufchateau. This hospital, with its 700 stalls, half of which were already occupied by incurable inmates, was rapidly filling. It had a splendid dipping vat, a sulphuration chamber, an operating table, stocks, and a full quota of medical supplies and surgical instruments. A research laboratory to be conducted with the hospital was among the early projects. There being no veterinary officer in France at that time with the requisite laboratory experience, a medical research officer was assigned from Base Laboratory No. 1 to conduct laboratory work. Afterwards, when Lieut. A. A. Leibold, v.c., arrived in France, Chief Veterinarian Hill assigned him to the Neufchateau staff "to construct, equip and maintain a veterinary research and diagnostic laboratory." The work carried out by this officer is given in the chapter. Point is made that the hospitals were lacking in numbers and in stall capacity. A staff memorandum from the Chief Veterinarian of the First Army and another signed by the Chief Remount Officer (Mather), August 18th, while the troops were mobilising around the St. Mihiel salient, notified the S.O.S. veterinary headquarters that hospitalisation would be required for 20,000 disabled army animals by November 1st. But no facilities approaching that magnitude were developed. The hospitals and the means of transporting animals to them were insufficient until the end of the War. These two fundamental factors were outstanding flaws of the World War veterinary service. Regarding causes that contribute to animal ineffectives, records of the veterinary office of the First Army furnish fairly good information on the diseases which caused most of the disabilities among the overseas animals outside the remount depôts, that is, the diseases that developed during the combat operations. From September 7th to November 15th the percentage of animals evacuated on account of contagious disease was: mange 15·47; influenza 4·03; lymphangitis 0·03; glanders (killed) 0·17, or a total of 19·70. Animals evacuated on account of non-contagious diseases were: for wounds and lameness 2·06 per cent.; mustard gas 0·03 per cent.; debility 7·05 per cent.; miscellaneous 1·75 per cent., or a total of 10·89 per cent. The total of animal strength evacuated was 30·59 per cent. As will be observed, mange and debility caused most of the evacuations. The incidence of glanders among the animals of the army was low. A much higher incidence of glanders is expected in the veterinary hospitals and remount depôts where animals are collected from many points. The extreme glanders phobia is a heritage of pre-mallein days. This disease, the prime scourge of military animals in the past, has capitulated to scientific veterinary medicine. The chapter concludes with the activities of Veterinary Hospitals Nos. 12 and 18.

Chapter LIV.—Post-Armistice Activities

Immediately after hostilities ceased on November 11th, divisions of the First Army, taking along the best animals, went on to Germany to become the Army of Occupation. The remnants of the First Army a month later repaired to the interior of France to await developments and to train. Headquarters were established at Bar-Sur-Aube (Aube). The troops were distributed over a territory approximately 40 miles wide and 60 miles long. The number of animals retained was 19,489. The First Army then consisted of three corps, the I, V and VIII, each having three divisions. Before moving, all of the animals belonging to these organisations were given the mallein test and otherwise inspected for morbidity. Nothing that occurred during the World War more clearly demonstrated the value of a well-organised Veterinary Corps than the difference between the good state of health maintained among approximately the same number of animals after the Armistice, and the miserable state that developed before our troops went into action the winter before. The animals of the First Army grew fat and sleek.

Glanders.—Glanders has been mentioned frequently in foregoing chapters in connection with its occurrence in military animals and particularly in respect to the danger of armies spreading the infection to animals of the civil population during and after hostilities. It is a disease requiring most careful attention. Fortunately, it can be controlled with precision by systematic malleinisation. For this purpose the intrapalpebral test, introduced by the French Veterinary Corps during the World War, is the most dependable. The thermic (subcutaneous) test is cumbersome for military purposes, and the ophthalmic test unreliable. The First Army, with its 93,000 animals, showed less than 1 per cent. of glanders at the time of the Armistice; the incidence of the disease at remount depôts, training camps and veterinary hospitals ran much higher.

Chapter LV.—Condensed History of the American Expeditionary Forces

This chapter accounts for the various Divisions at the Closing Phase—who their Commanding Generals were, their origin, their dates of arrival overseas, their activities, total casualties in personnel, the animal situation, and the names of the Division Veterinarians.

Chapter LVI.—Official Documents of the World War of Special Interest to Veterinarians

A.E.F., G.O. No. 39 will always remain historic in the annals of the veterinary profession. It was a formal announcement by the Commander-in-Chief of the A.E.F. to the Surgeon General of the Army, that the Veterinary Corps in France would not be commanded by the Medical Department. It constituted a general provision for the organisation of the remount service and shows that no veterinary service, except such units as the remount service might require, was planned for the A.E.F. With all its imperfections G.O. No. 39 had one excellent feature, a feature omitted entirely from all the regulations that came to the First Army from Washington. It directed advance veterinary hospitals to go forward to the combat troops and relieve them of their disabled animals. Unfortunately, this provision was never enforced. Special Regulations No. 70, W.D., December 15th, 1917, signalised the official birth of the Veterinary Corps of the United States Army. Although the order governed the operations of the Veterinary Corps in the United States from the beginning of 1918 until demobilisation, it did not become official overseas until August 24th, 1918, at a time when it was impossible to put it into effect among the combat troops. The unscientific nature of the notion of combining the Veterinary Corps activities physically with those of the remount service was emphasised by Major Klein in a memorandum to the Chief Surgeon, A.E.F., but, of course, this protest did no good—[a copy of Major Klein's memorandum is quoted in this chapter]—probably no one at Chaumont ever read it. Had someone in authority done so, the animal management of the expedition might have been made a less deplorable record, and much of the anxiety over animal shortage might have been avoided. In the last paragraph of his memorandum Major Klein states that the attachment of veterinary hospitals to remount depôts will not assist in their administration or facilitate their co-operation with the other parts of the veterinary service. Since the function they are organised to perform is supplemental to, and directly connected with, the work of the veterinary personnel operating with the mobile organisations in the zone of the advance, it would seem that the best results could be expected if all were placed under one administrative head with veterinary training. If the A.E.F. had made one-half the effort that was made by the French and British to conserve animals, it would have had a sufficient number to do all the cartage the army needed during its brief activities. The demonstrated fact that 85 per cent. of the animals disabled in war can be returned to service by a well-established veterinary service is accepted.

Chapter LVII.—The Present Army Veterinary Corps, 1920-1935

This chapter is presented in order that those whose interest may have been aroused, will have at hand succinct information concerning the present veterinary service of the army, and general plans for its employment in case of the mobilisation of a citizen army.

***The National Defence Act of* 1920.**—The national defence policy of the United States was established by an Act of Congress, June 4th, 1920. This Act, and amendments since enacted, established the present Army of the United States, which comprises three main components, the Regular Army, the National Guard, and the Organised Reserves.

The Regular Army.—The Regular Army was given an authorised strength of 280,000 enlisted personnel and 17,728 commissioned personnel by the National Defence Act of 1920. Of the latter, 185 were veterinary officers. The size of the Regular Army has since been reduced by limiting appropriations to 125,000 enlisted personnel and 12,000 officers, of whom 126 were veterinary officers. By executive order it was further reduced to 130,000 of all ranks, and still more recently (July 1st, 1935) raised to 165,000 enlisted and 12,000 commissioned personnel. The function of the Regular Army is manning the military posts of Continental United States, guarding the Panama Canal, Alaska, and the insular possessions. A third function of the Regular Army is to furnish a national police force to enforce, if necessary, the laws of the United States, to suppress insurrections, assist local authorities in maintaining order and provide relief in case of riots, fires, floods and other catastrophies with which local authorities are unable to cope. In case of a national emergency calling for a great military effort, the Regular Army would furnish a trained personnel for the overhead of camps and other zone of the interior, installations, and a nucleus of trained officers about which to mobilise the man power of the country.

The National Guard.—The National Guard comprises what was formerly State Militia. The authorised strength of the National Guard is 235,000. There are about 150 veterinary officers in the National Guard. If the National Guard were called into the service of the United States in a national emergency and its

units brought up to war strength—435,000—about 235 additional veterinary officers would be required.

Organised Reserves.—The United States relies upon a citizen army for its defence in any major emergency. If the military force required were 4,000,000—and a greater number than this was inducted into the service during the World War—it will be seen that the Regular Army at its present strength would constitute but one in 28 of the total, and the present National Guard less than one in 17.

Officers' Reserve Corps.—The Officers' Reserve Corps consists of officers of all grades, and of all arms and services who have been commissioned in the army reserve. It numbers about 113,000, which is about the present procurement objective of the War Department. The procurement objective in veterinary officers is 1,647. The number on the active list (June 1st, 1935) is 626, or 38 per cent. of the objective. This is bad showing for the veterinary profession. But little more than one-third of the veterinary officers required immediately upon a general mobilisation of the military forces of the country are receiving any training whatever for the duties that would be theirs to perform.

The Veterinary Reserve is a Responsibility of the Veterinary Profession.—It is a logical duty of the American Veterinary Medical Association to do all in its power to improve the army veterinary service to a point where it will compare favourably with the Reserve of the other professions. The present situation is a reflection upon the patriotism of the veterinary profession and in case of a major national emergency, must inevitably injure the profession's reputation for competence. Ordinarily appointments in the Veterinary Reserve are made only in the grade of first lieutenant, in the case of applicants who have had no previous commissioned service. Former officers may be commissioned in grades not above the highest previously held.

The Veterinary Service of a Division.—The veterinary service of an infantry division consists altogether of 15 commissioned officers and 116 enlisted men. Normally the division veterinarian is a major. The commander of the veterinary company, one officer with each of the light artillery regiments, are captains; the meat inspector, the four officers with the infantry regiments, two officers with the veterinary company, the two officers with each light artillery regiment, and the officer in engineer regiments are first lieutenants. There are therefore the following veterinary officers in an infantry division: one major, four captains and ten first lieutenants.

The Veterinary Service of a Cavalry Division.—The veterinary troops have but two commissioned officers and 50 enlisted men, and each cavalry regiment has two officers and 14 enlisted men. The veterinary service of a cavalry division thus comprises 16 officers and 130 enlisted men.

The Veterinary Service of a Corps.—The type corps consists of headquarters, certain corps troops, and three infantry divisions. The veterinary service of a corps consists of that in the corps surgeon's office. In the corps surgeon's office is a corps veterinarian—lieut.-colonel; an assistant—captain; and two enlisted men. Among the corps troops there is a medical regiment which, as in the division, contains a veterinary company of three officers and 70 enlisted men. The total veterinary service of corps troops thus comprises eight officers and 82 enlisted men.

The Veterinary Service of an Army.—The type army comprises headquarters, certain army troops including two cavalry divisions and three corps of three divisions each. The veterinary service of an army, like that of corps and divisions, is a part of the Medical Department. The army veterinary service includes two officers and three enlisted men in the office of the Army Surgeon, twelve officers and 280 enlisted men in the veterinary companies of the four medical regiments included in the army troops; 24 officers and 648 enlisted men in the three veterinary evacuation hospitals and nine officers and 235 enlisted men in the veterinary convalescent hospital. In addition, there is one veterinary officer and one enlisted man in the medical supply depôt; three veterinary officers and ten enlisted men in the field remount depôt; and one veterinary sergeant with the military police battalion. Thus the veterinary service of the type army includes 51 officers and 1,178 enlisted men. The army veterinarian is normally a colonel; his assistant a captain. The four hospital commanders are lieut.-colonels, and their four executive officers and the veterinary officer in the medical supply depôts are majors. In addition, there are in each veterinary evacuation hospital two captains and four first lieutenants, and in the veterinary convalescent hospital three captains and four first lieutenants.

Veterinary Service of the Communication Zone.—The veterinary service in the headquarters Medical Service C.Z. comprises five officers: one lieut.-colonel, two majors, one first lieutenant and five enlisted men. In the General Medical Laboratory the veterinary service comprises four officers: one lieut.-colonel, one major, two first lieutenants, and 18 enlisted personnel.

The Veterinary General Hospital is the principal veterinary installation in the Communication Zone. Its organisation provides for ten veterinary officers, one medical officer and 250 enlisted men, of whom 245 belong to the veterinary service and five to the medical

service. The number of Veterinary General Hospitals would be generally about one for each army.

Veterinary Evacuation Hospitals. — These installations are divided into three sections: a hospital section, a service section, and a collecting section. Ordinarily, one Veterinary Evacuation Hospital will be established for each corps in action on a front.

Station Veterinary Hospitals are established in the Communication Zone as may be required. A Station Veterinary Hospital has four officers (one captain and three first lieutenants) and 72 enlisted personnel. Thus a type army requires the continuous hospitalisation of approximately 12,000 animals. The veterinary hospitals provided under the present organisation have a capacity of 2,250, or less than one-fourth of the capacity actually required. Experience has shown with finality that a veterinary general hospital should have a capacity of 2,000 animals for economical and efficient operation. It is fairly safe to conclude, on the basis of World War experiences, that the veterinary evacuation hospital should have a capacity of 1,000 animals. The hospitalisation provided for approximately 100,000 animals of a type army, therefore, would appear to require (1) in the Army Area, three veterinary evacuation hospitals and one veterinary convalescent hospital with a capacity of 1,000 animals each; (2) in the Communication Zone, three veterinary general hospitals with a capacity of 2,000 animals each, and one veterinary convalescent camp or farm with a capacity of 2,000 to 4,000 animals. Experience has shown conclusively that veterinary hospitals of this size are more efficient and can be operated more economically than the small hospital units now provided by Tables of Organisation. Under the present War Department General Mobilisation Plan, 1,773 veterinary officers are allotted to the service. Of these 1,773 officers, 1,647 are veterinary reserve officers and 126 veterinary officers of the Regular Army. Only 38 per cent. of ,the quota of reserve officers are commissioned and assigned to units in the four field armies that the General Mobilisation Plan contemplated. There were 1,021 vacancies in the veterinary officers' reserve on June 1st, 1935. The effect of the shortage on the veterinary profession is such that if officers be not found and at least partially trained to fill these 1,000 vacancies before the outbreak of war, the inefficiency of the World War service, in part, will be repeated to the detriment of our standing among the army services. The critical test of any military arm or service is its performance in the field in actual operations. The purposes of the veterinary services of a field force or, with appropriate modification, of any military veterinary services are (1) to preserve the animal strength of all the units of the organisation concerned; (2) to care for and treat sick and injured animals and convert casualties into replacements; (3) to insure the wholesomeness of all meat and meat food products; all dairy products, and of all forage used by the field force. The foregoing includes two important tactical functions; that of relieving the troops in action of the encumbrance of non-effective animals, and of supplying animal replacements, without which army transportation breaks down at critical times. In annual reports, the Surgeon General has repeatedly stated that the personnel of the Veterinary Corps is inadequate to meet the needs of the army, and has recommended an increase in both commissioned and enlisted grades. The achievements of the present veterinary service of the Regular Army consist, in the main, of performing its duties in the care of animals, food and forage inspection, and instruction of Regular, Reserve, R.O.T.C. and C.M.T.C. personnel in a manner to win the approbation of post, corps area, and department commanders, the Surgeon General, and the War Department General Staff. During the World War a Veterinary School of Meat and Dairy Hygiene and Forage Inspection was developed at Chicago, Ill. Late in 1923 the Chicago school was moved to the newly-created Army Medical Centre at Washington, D.C., and incorporated into an Army Veterinary School. The course for veterinary officers at the Army Veterinary School has developed into one of the finest post-graduate courses in veterinary medicine to be found anywhere in the world.

Chapter LVIII.—Dogs in the Military Service

This chapter relates to the use of war dogs in transport, as medical corps dogs, patrol dogs, dispatch dogs, sentinel dogs, and concludes that the use of dogs in the United States Army is a special service of which sight should not be entirely lost, inasmuch as their value as assistants to patrols, and in liaison work is unquestionably practical, inexpensive, and probably indispensable under certain conditions. It seems reasonable to suggest that such a service operated under definite regulations, and maintained at a high state of efficiency by simulated warfare should be more than amusing.

Chapter LIX.—Gas Warfare and Animal Transportation

The British, in one report covering the period 1916-1918, give the total number of horses gassed as 2,200 with a mortality of 221. During the same period casualties from gun fire were 79,135, with 55,600 deaths. In view of the fact that the British kept good records of what was transpiring among the animals, this ratio gives a fair idea of the gas casualties of the World War in their relationship to total casualties.

During August, 1918, the German veterinary corps reported only 312 gas intoxications with 54 deaths among their horses on the Western Front.

The principal injury sustained was mustard gas burn on the back, legs and sheath, occurring several days or perhaps in some cases more than a week after the troops had advanced over the gas-poisoned terrain. Of the various toxic gases, carbon monoxide was not used in the World War, so far as is generally known. Hydrocyanic acid is a dangerous instrument of war; it kills quickly. Benzyl bromide has an elective action on the conjunctiva: this was the famous "tear gas" of the Western Front during the World War. Sneezing gases consist mainly of aromatised arsenic-chlorine chemical compounds. Of suffocating gases, chlorine is, of course, known to all. Phosgene is a compound of chlorine and carbon monoxide. According to Reichter, suffocating gases have a remote as well as an immediate effect on horses. Six to twelve hours after exposure, the respiratory irritation manifests itself by the usual signs of broncho-pneumonia. Walking them slowly out of the danger zone is an indispensable precaution set down for the handling of animals in a gas attack. Haste increases respirations and, therefore, the intake of the toxic air. As treatment, subcutaneous injection of oxygen is recommended by German veterinarians.

The gas warfare of the next war is shrouded in mystery for the layman. To what extent it will figure in the fate of man and animals remains for the military expert to disclose at the proper time and place.

Chapter LX.—Rail Shipment of Animals in Peace and War

Transportation of animals by rail is a matter of tremendous importance in general mobilisation and in military operations. In the conservation of serviceable animals care in transit is paramount. In transporting valuable animals (every military effective is valuable) careful handling at every step to prevent injury, exhaustion and infections should be an immutable law and recklessness a matter for disciplinary action. Moreover, when the conservation of other animals (sheep, hogs, cattle) is a sacred duty, as it always is when nations go to war, reckless handling of them at collecting points, on transports, or at destination, is unreasonable neglect of duty. Mention has been made of the losses of disabled animals in transit from the battlefields (France) to the veterinary hospitals and reference is also made to the extraordinary death-rate of horses on trains and at destinations in the United States during 1917-18.

Chapter LXI.—Army Veterinarians, 1866-1935

This chapter gives a list of the veterinarians of the "Old Army" and names, war-time rank, State of origin, and principal assignments of all veterinarians commissioned in, and on duty with, the Veterinary Corps during the World War.

Epilogue

From authors who have spent a lifetime among animals in their sundry estates, and have attempted, always, to appraise correctly an opinion on the controversial question of the rôle of domestic animals in future military operations, there can be no disagreement. No nation can survive a perishing animal industry; no army can exist without commodities of animal origin. In the matter of transportation within the army itself, the importance of animals has been hotly debated in recent years. The internal combustion engine, on the ground and in the air, has been loudly proclaimed as the instrument of replacement. To this we yield no ground. Horses and mules in a field army will be used in the next great war, perhaps in greater numbers than ever before; no other conclusion is tenable in the light of our studies and experiences. It is hoped our country may not be swayed beyond the horizon of common sense in this significant factor of national defence. Intensifying warfare, with the ever-multiplying array of machinery and ever-increasing requirements for munitions that must be transported, and rations that must be delivered, will increase the need of animals to support its exploitation. In the minds of thoughtful commanders, machinery is but an auxiliary to the arms. The doughboy is the determining factor now as formerly, and in the supplies brought to him over the last ten miles of God-forsaken terrain by animals lies his principal hope of achieving his objective. Both trudge, flounder, scramble, crawl and climb, through rain and snow and fog, over forbidden terrain, while mechanical auxiliaries await favourable situations that may not develop. Peace-time conceptions of real warfare are perilous and unreliable; in respect to the use of animals they are comical. There are forces of nature yet to be overcome before the army horse and the army mule yield their places in the military service. Past wars have not been, and future wars probably will not be, fought under a high "ceiling" and over firm terrain, unencumbered by obstacles insurmountable to any vehicle the ingenuity of man has yet devised. The mind reverts to the South Slope of Little Round Top, where an important cavalry charge was made during the Battle of Gettysburg, or the morass of Bannockburn, or thousands of square kilometers of mire and forest in the Somme and the Argonne. Peace-time manœuvres are held in areas selected for

(*Continued at foot of col.* 1, *page* 294.)

N.V.M.A. Branch Report

SCOTTISH BRANCH*

MEETING AT PERTH

A general meeting of the Scottish Branch was held in the Station Hotel, Perth, on Saturday, January 25th, 1936.

The President (Mr. A. Young) occupied the chair and there were present Messrs. W. M. Ferguson, H. W. Robson, D. Cumming, W. S. Lornie, G. T. Weir, H. M. Wilson, A. Brownlee, C. Tracy, D. Campbell, J. F. Taylor, A. Thomson, P. McIntyre, J. W. Burgess, A. Spreull, J. Gibson, J. Brown, T. M. Inglis, W. Nairn, H. Gillmor, J. N. Ritchie, Professor W. M. Mitchell, Major J. G. McGregor, Messrs. D. Brown, S. Jamieson, A. Sellars, G. A. Sangster, R. M. Smith, S. J. Edwards, L. Robertson and the Hon. Secretary (Geo. F. Boddie).

Owing to a severe snowstorm many members were delayed. The essayist (Mr. S. J. Edwards) found it necessary to travel by road, and only those who knew the appalling conditions could appreciate the struggle Mr. Edwards must have had to reach Perth.

Apologies for inability to attend were received from Dr. O. Charnock Bradley, Dr. Dryerre, Mr. Sewell, Major Baird, Messrs. J. Anderson, M. H. W. Miller, Professor Robb, Dr. A. W. Whitehouse, Mr. R. G. Anderson, Mr. Watt, Professor Linton, Professor Weir and Mr. A. Pottie.

The Hon. Secretary stated that the minutes of the meeting of April 13th, 1935, had been printed in full in *The Veterinary Record* of June 22nd, 1935. On the motion of the President, seconded by Mr. Nairn, the minutes were approved.

The Hon. Secretary intimated that there was no correspondence requiring the attention of the general meeting.

* Received for publication February 11th, 1936.

Paper.—The President called upon Mr. S. J. Edwards, of the Hannah Dairy Research Institute, Kirkhill, Ayr, to deliver his paper entitled "Mastitis in Dairy Cattle." [This paper is reproduced, together with a report of the discussion which followed its presentation, at the commencement of this issue.—*Editor.*]

Mr. Nairn proposed a vote of thanks to Mr. Edwards for his paper. Professor Mitchell seconded this tribute, which was paid with obvious sincerity by the meeting.

Representation on Council of N.V.M.A.—Professor Mitchell raised the question of the size of the Council of the N.V.M.A., which he thought was too large, and asked for the views of the members present. He thought it would make for better working of the "National" Council if two members were elected from each Division and two from each Branch. It might then be possible to get payment of the expenses of all representatives on the "National" Council.

Mr. Thomson, speaking in support of what Professor Mitchell had said, observed that he had studied the names in the N.V.M.A. Congress Handbook compared with those in the R.C.V.S. Register, and had found that nearly 100 per cent. of the profession in Scotland were members of the N.V.M.A., a much higher proportion than in England.

Mr. Nairn thought that Professor Mitchell's proposal would meet with considerable sympathy, as many felt that the "National" Council was too large. It would make for efficiency if the "National" Council were smaller.

The majority of the members having taken part in the subsequent discussion, Mr. Nairn proposed that the matter be referred to the Executive Committee to draft a resolution to submit to the Council of the N.V.M.A. at their next meeting. Professor Mitchell seconded this motion, which was carried unanimously.

Vote of Thanks to Chairman.—Mr. D. Campbell proposed a hearty vote of thanks to the President for his services in the chair.

Geo. F. Boddie, *Hon. Secretary.*

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the purpose and at a season when inclement weather is least likely to interfere, and yet within a year such manœuvres were held up for a whole day, in Western Texas of all places, to wait for the surface to dry following an unexpected rain. Nor is the period of nearly two weeks during the winter of 1935, when planes could not leave the Chicago Municipal Airport, so soon forgotten.

[*The two volumes, price* $10 *the set, can be obtained from the Veterinary Magazine Corporation, 75, East Wacker Drive, Chicago, Ill.*]

J. M.

Sir Victor Warrender, Financial Secretary to the War Office, in a written Parliamentary reply, says that all Army animals in Egypt which, on the mechanization of their unit, cannot be absorbed into another unit will be destroyed under military supervision. None will be sold to the local inhabitants.

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At a meeting on January 4th of the Société de Biologie Dr. F. Van Deinse gave an account of his attempts to immunise rabbits against tuberculosis by intravenous and subcutaneous injections of avian tubercle bacilli. Type S, killed by heat. He claimed to have succeeded in immunising rabbits in this manner against massive intravenous injections (1 mg.) of live cultures of the same type.

N.V.M.A. Divisional Report

VETERINARY MEDICAL ASSOCIATION OF IRELAND*

ANNUAL GENERAL MEETING AT DUBLIN

The Annual General Meeting of the Veterinary Medical Association of Ireland was held in Gresham Hotel, Dublin, on Friday, January 31st, 1936, at 7.30 p.m.

The following members were present: Messrs. Sean O'Donovan, Professor J. J. O'Connor, J. J. Dundon, A. F. O'Dea, W. E. MacDonald, J. M. Morris, M. J. Byrne, J. M. Murphy, Professor T. G. Browne, F. O'Leary, J. F. Timoney, L. M. Magee, J. E. Fitzgerald, J. P. Nowlan, John A. Flynn, J. D. Whitty, J. E. Kenny, P. A. Carroll, H. O'Leary, A. A. Donnelly and O. D. Neary.

The minutes of the previous meeting, having been circulated, were read and signed.

Correspondence. — (1) Apologies for non-attendance were received from Messrs. J. V. Carroll, E. W. Little, P. F. Dolan, T. Mulcahy, T. Mernagh and W. P. Cushnahan.

(2) A letter from Major-General Sir John Moore, K.C.M.G., C.B., F.R.C.V.S., was received, tendering his resignation from the Association owing to his inability to attend meetings. It was proposed by Professor O'Connor, seconded by Mr. Magee and passed unanimously that Sir John Moore be made an Honorary Associate of this Association and that a certificate be sent him accordingly.

Hon. Secretary's Report

The Hon. Secretary's Report for the Year 1935 having been circulated, it was proposed by Mr. Donnelly, seconded by Mr. O'Dea and passed unanimously that the Report be adopted. This report was as follows:—

Five general meetings were held during the year, including the provincial meeting at Mallow.

The average attendance at the general meetings was 25, the largest number being 40 at the May meeting and the smallest 15 at the August meeting.

Nine Council meetings were held.

I.—Business at the General Meetings

(*a*) The Annual General Meeting

The chief items of interest were:—

1. *The election of officers* for the coming year, *viz.*, President: Sean O'Donovan; Vice-Presidents: H. O'Leary and A. F. O'Dea; Hon. Treasurer: Professor T. G. Browne; Hon. Secretary: Professor J. J. O'Connor; Council: M. J. MacClancy, C. M. Griffin, S. Conway, J. A. Flynn and P. J. Gaffney.

2. *The Presidential address*, in which the President, having returned thanks for the honour conferred upon him, referred to several matters of interest to the profession and exhorted those who are not members to join the Association so as to co-operate in furthering the interests of the veterinary profession and all that it stands for.

3. *Presentation by the Hon. Treasurer of the Balance Sheet* for the year 1934, showing a credit balance at bank of £46 19s. 7d. Subscriptions amounted to £61 8s. 6d. and dividends to £16 9s. 2d.

4. *Victoria Veterinary Benevolent Fund.*—On the motion of Professor Browne it was resolved that in future, along with the appeal for the annual subscription an appeal be also made for a minimum subscription of 5s. towards this Fund for all members of the Association who are not already subscribers to the Fund.

5. *Entertainment by the President.*—On the termination of the meeting, the members present were hospitably entertained by the President.

(*b*) General Meeting, May 8th.

1. *Demonstrations* were given by

(1) Professor J. J. O'Connor, of

(*a*) Hysterectomy in the bitch with intravenous nembutal anæsthesia;

(*b*) Excision of the lateral cartilage in a horse.

(2) Professor Browne, of spinal anæsthesia.

(3) Professor Craig, of the examination of the genital organs in a cow, assisted by epidural anæsthesia.

(4) J. S. MacCann, of a method of casting the horse.

2. *The P.D.S.A.*—Arising out of a letter from the Hon. Secretary of the Irish Animals Protection League, the Hon. Secretary reviewed the situation as between the Veterinary Council and the P.D.S.A., with reference to their attempt to get permission from the Government to have their van reinstated in Co. Limerick. After the discussion which ensued, a committee was appointed to draw up a statement to be published in the press for the purpose of propaganda indicating the readiness of the veterinary profession to provide for treatment for the animals of the poor.

3. *The Hospitals Sweep and Veterinary Research.*—It was intimated that Senator Parkinson had suggested that the Association should again take action in this matter and it was decided to consider it at the next Council meeting.

4. *Circulated Report of People's League of Health* was considered and it was eventually decided to draw the attention of the National Veterinary Medical Association to the matter.

(*c*) General Meeting, August 6th.

1. *Correspondence re* (*a*) Fur-Bearing Animals; (*b*) The Dalrymple-Champneys Prize, and (*c*) Representatives to the Council of the N.V.M.A. of its Divisions.

2. *Resignation of Professor J. F. Craig.*—A resolution was passed regretting the resignation of Professor Craig from the Association to take up a new appointment and it was decided to make arrangements for a presentation to Professor Craig as a mark of the esteem in which he is held by members of the profession in Ireland and the graduates from the Dublin Veterinary College outside Ireland.

* Received for publication February 11th, 1936.

3. *Impromptu Discussion on Clinical Cases.*—Owing to the unavoidable absence of Mr. L. M. Magee, who was to provide a paper for the meeting, an impromptu discussion on clinical cases took place, which proved interesting and instructive.

(*d*) General Meeting in Mallow, June 29th.

This was a very successful and well-attended meeting, there being representatives present from all parts of Munster. It was also a very pleasant social reunion.

1. Mr. Pierse read a paper entitled: "A Diagnosis of Tuberculosis under the Tuberculosis Order having reference to the forms of Tuberculosis dealt with under the Order."—The paper was a masterly production and was listened to with great interest. It gave rise to an interesting discussion in the course of which the speakers cordially congratulated Mr. Pierse on the excellency of his paper.

2. *X-ray Demonstration.*—Messrs. Armstrong and Taylor, of the Victor X-ray Corporation, gave a very interesting demonstration of radiography and described its uses and its limitations. Mr. H. O'Leary also spoke of its utility and offered the use of his X-ray apparatus to members on reasonable terms.

(*e*) General Meeting, November 15th.

Mr. P. F. Dolan, M.R.C.V.S., D.V.S.M., read a paper entitled "Scientific Production of Milk," illustrated by excellent lantern slides. A very good discussion ensued and Mr. Dolan was complimented by all the speakers on the very interesting and instructive nature of his paper and of the slides with which it was illustrated.

II.—Business at Council Meetings

(*a*) Council Meeting, February 6th.

1. *Fees for Tuberculin Testing for the Department of Agriculture.*—Arising out of a letter from Mr. T. Carroll, M.R.C.V.S., Cavan, commenting upon the necessity of a standard fee being charged by all veterinary practitioners for applying the tuberculin test to Departmental and other cattle, it was resolved that a copy of the scale of fees drawn up by the Association be circulated to members of the profession not already circularised and to point out that the scale was for tubercle-free herds as already indicated to the Department.

2. *Veterinary Appointments in Croom.*—Having learned by a letter from Mr. Harnett that a remuneration of £80 per annum was offered for appointments under the Dairies and Cowsheds Order and approximately £120 for those under the Tuberculosis Order and Diseases of Animals Acts, and that the total salary for these positions should be at least £250 per annum, it was decided to ask the veterinary surgeons in the district to agree amongst themselves as to an adequate salary and to inform the Association of particulars of the work to be done and the area to be covered.

3. *Programme for* 1935.—A provisional programme for the meetings for 1935 was made out.

4. *Veterinary Appointment in Tipperary No.* 2 *Rural Area.*—The matter of this appointment, which was advertised at £57 per annum under the Diseases of Animals Acts and Bovine Tuberculosis Order and in connection with Meat and Milk Supplies, was brought forward by Mr. Condon, M.R.C.V.S. It was decided to write to Mr. Condon and Mr. O'Mears regarding this advertisement and asking their opinion as to the adequacy or otherwise of the salary offered.

(*b*) Council Meeting, March 5th.

1. *Croom Veterinary Appointments.*—It was learned that at a meeting of part-time veterinary inspectors of Co. Limerick it was decided that the lowest adequate total salary for these appointments should be £270 per annum. It was decided to circularise the veterinary surgeons in Croom vicinity advising them not to accept less than this amount.

2. *Correspondence from Messrs. Condon and O'Mears* giving the information asked for *re* the Tipperary No. 2 Rural appointment. It was decided to circularise the veterinary surgeons in the vicinity asking them not to accept the position for less total remuneration than £150 per annum.

3. *Inspection of Meat and Milk, Edenderry No.* 3 *Rural District.*—Letter from Mr. Crowe, intimating that he had been appointed at £35 per annum. It was understood that Mr. Crowe did not accept the appointment. It was decided to adhere to a previous decision that the salary should not be less than £100 per annum.

4. *Central Library for Animal Diseases.*—It was agreed to recommend that a subscription be sent in response to the appeal for support of a fund for this object.

5. *Supervision of Meat and Milk, Carrick-on-Suir No.* 1 *Rural District.*—Letter from Mr. Mulcahy saying that he had been invited to accept this appointment at a salary of £25 per annum and that he had declined the offer on the ground that the V.M.A.I., considered the remuneration inadequate.

6. *Commission or Committee to consider Reorganisation of the Veterinary Services in the Irish Free State.*—This committee was appointed.

7. *Duties of Veterinary Officers holding Public Appointments.*—It was decided to ascertain for each part-time and whole-time veterinary officer in Saorstat Eireann various details as to area of their districts and the amount of work to be performed, so that the Association would be in a position to advise what would be adequate remuneration in specific cases.

8. *Circularising Members of the Veterinary Profession* re *Salaries for Public Appointments.*—It was decided to do this, intimating that before applying for any public appointment members should consult the Hon. Secretary, in order to determine what would be an adequate salary for the position.

(*c*) Council Meeting, March 21st.

1. *Fee for Veterinary Lectures for the Department of Agriculture.*—Having received a letter from Mr. W. Nyhan to the effect that he had offered to deliver ten lectures on sterility at £3 3s. per lecture, that the Department had asked him to accept £2 2s. per lecture with travelling expenses and 10s. per night subsistence allowance when away from home and that he had decided not to reply to the request until he had consulted the Association, it was decided to reply to Mr. Nyhan approving his action and informing him that 15s. per night be demanded as subsistence allowance.

2. *Tuberculin Testing of Dairy Cows in Cork City and its Vicinity.*—A complaint having been made by a veterinary practitioner in Cork that a whole-time veterinary officer of the City had tested some dairy cows free of charge and an inquiry having been made by the Association, the chief veterinary officer for Cork City informed the Association that the object of the free testing was to initiate the production of milk of a higher quality (Grade A [T.T.]). It was

decided to write to the chief veterinary officer saying that the Association appreciated the circumstances under which the test was applied, but that they disapproved of whole-time officers doing the work.

3. *Veterinary Inspectorship, Louth Rural District.*—Having received a letter from Mr. A. Donnelly, M.R.C.V.S., saying that he had refused an offer of £25 per annum for this work and suggesting that certain named veterinary surgeons be circularised advising them not to apply for the position unless a salary of £75 per annum were offered, it was decided to comply with Mr. Donnelly's request.

4. *The Milk Bill.*—A committee was appointed to reconsider the Milk Bill. The committee met on March 25th and as the result of the meeting a statement was drawn up for presentation to the Minister for Local Government and Public Health embodying several suggested alterations in the provisions of the Bill. A copy of this statement having been forwarded to the Minister, he replied making certain observations on the points raised therein and expressing appreciation of the interest taken by the Association in the Bill and of the help which they had so generously afforded him in framing its provisions.

(*d*) Council Meeting, April 2nd.

1. *Dr. O'Callaghan's Statement in his Paper on the Milk Bill.*—Mr. Dundon, M.R.C.V.S., having drawn attention to this matter, a committee was appointed to formulate a letter in reply to Dr. O'Callaghan's statement. This was done and a copy of the letter was sent to all the principal daily papers, to the Minister for Local Government and Public Health, to the Secretary of the Irish Medical Association and to the President of University College, but was only published in the *Irish Independent* and *Limerick Leader*.

2. *Mr. Condon and the Tipperary Co. Council* on the question of the supply of milk for the poor children of the district. Mr. Condon was asked to give particulars of correspondence, etc., in this matter to the Hon. Secretary with a view to bringing it to the notice of the Minister for Local Government and Public Health for his observations. Mr. Condon complied with this request and a copy of his letter, with enclosures of copies of correspondence which passed between the Co. County and the Local Government on the question was sent to the Minister for Local Government and Public Health. Mr. Condon made every effort to induce the authorities to supply High Grade Milk to the poor children, but his suggestions were negatived on the ground of expense.

(*e*) Council Meeting, May 30th.

1. *Free Treatment of the Animals of the Poor.*—This question arose out of a letter from the Irish Animals Protection League read at a previous meeting. It was decided to consider the question at the next Council meeting and to invite to that meeting Mr. Smith, who was acting as veterinary surgeon to the I.A.P.L., and also the veterinary surgeons practising in Dublin.

2. *Hospital Sweep and Veterinary Research.*—It was agreed to summon a meeting of the committee appointed in connection with this matter, to reconsider it and prepare a case for allocation of money from the Fund for veterinary research.

3. *Dispute between Department of Agriculture and Veterinary Staff.*—A list of veterinary practitioners who might be asked to do duty for the Department owing to the shortage of the veterinary staff having been received from the Hon. Secretary of the Veterinary Officers' Association, it was resolved to send a copy of the Hon. Secretary's letter to each of the members thereon and to request them not to apply for or accept such an appointment until the dispute was satisfactorily settled.

4. *Endowment Fund for the Library of the Royal College of Veterinary Surgeons.*—In response to an appeal from the Secretary of the National Veterinary Medical Association, it was decided to send a subscription of £2 2s. towards the Fund.

5. *Salary for Meat Inspector in Laoggish.*—Mr. Fitzpatrick, M.R.C.V.S., Mountrath, having sought the advice of the Association as to remuneration for this post, he was advised to demand £150 per annum, *i.e.*, at the rate of 3d. per sheep and 1s. per beast.

(*f*) Council Meeting, August 27th.

1. *Carrick-on-Suir Local Appointment.*—Mr. Mulcahy explained the nature of the duties involved and it was decided that £50 per annum would be a reasonable salary to demand for this work.

2. *Deputation of Meat Examiners.*—Mr. Harnett presented a detailed report of a recent deputation of Meat Examiners to the Minister for Agriculture. The report stated that the Minister had definitely promised to establish the Meat Examiners and put them on a higher scale than £300 to £500 per annum on account of the arduous nature of the work involved. In view of the fact that the Association had already accepted the £300 to £500 scale for Veterinary Inspectors in the Department, it was unanimously decided not to boycott these appointments but that in the event of advertisements at this scale appearing in the near future a Council meeting be summoned to consider the matter.

(*g*) Council Meeting, August 30th.

1. *Position of Meat Examiners.*—Advertisements for Meat Examiners having appeared in the press on August 29th, the matter was discussed and it was decided not to call a boycott of these appointments. It was also decided to write to the Minister for Agriculture demanding that the appointments be made permanent at commencing salaries not less than those received at present by existent Meat Examiners, and calling attention to the inadequacy of the salaries offered in view of the nature of the duties to be carried out.

2. *Resignation of Hon. Secretary's Assistant* (Mr. J. L. Dinnigan).—This having been announced, it was decided that the present Registrar of the Veterinary College, Mr. S. J. Kavanagh, be appointed on the same conditions as his predecessor.

(*h*) Council Meeting, September 10th.

1. *Resignation of the Hon. Secretary* (Professor J. J. O'Connor).—Professor O'Connor submitted his resignation on account of his appointment as Principal of the Veterinary College. The Council accepted his resignation with extreme regret. The President, on behalf of the Council, congratulated Professor O'Connor on his appointment and the Council resolved that their appreciation of his valuable services to the Association during his long term of office be put on record. Professor O'Connor returned thanks to the President and Council for their kind congratulations and expression of appreciation of his services. Professor O'Connor intimated that it was the expressed wish of the Department

that no member of the Departmental Veterinary Staffs be asked to accept the position.

Hon. Treasurer's Report.—On the motion of Professor Browne, seconded by Mr. J. E. Fitzgerald, the Hon. Treasurer's Report for the year 1935 was adopted. The balance-sheet showed a credit balance at bank of £63 3s. 8d. Subscriptions amounted to £93 6s. and dividends to £17 14s. 8d.

Professor Craig.—It was proposed by Mr. Magee, seconded by Professor Browne and passed unanimously that Professor J. F. Craig be made an Honorary Associate of this Association and that a certificate be sent him accordingly.

Benevolent Fund.—It was decided to circularise the profession again on the same lines as last year *re* the Benevolent Fund.

Mr. O'Leary, speaking on the subject of the Veterinary Benevolent Fund, stated that towards the end of the Greyhound Racing Track season it was usual to hold a limited number of meetings, the proceeds of which were devoted to charitable purposes and that there might be a possibility of coming to an arrangement with the Track Manager at Shelbourne Park to have one of these meetings held to help this Fund.

Mr. O'Leary then proposed, Mr. Magee seconded and it was passed unanimously that the Track Manager at Shelbourne Park be approached on the subject, and the following deputation was appointed to interview the Track Manager: Mr. F. O'Leary, Professor O'Connor, Professor Browne, Messrs. S. O'Donovan, H. O'Leary and J. M. Murphy.

Assistant Secretary.—A letter from Mr. S. J. Kavanagh (successor to Mr. Dinnigan, Veterinary College of Ireland) was read, stating that he was prepared to act as Assistant Secretary to the Veterinary Medical Association of Ireland at a salary of not less than £30 per annum. After discussion, it was proposed by Mr. H. O'Leary, seconded by Mr. O'Donovan and passed unanimously that Mr. Kavanagh be appointed Assistant Secretary at a salary of £25 per annum, that the Council examine the amount of work to be done by the Assistant Secretary and that they be empowered to grant, if they think fit, an honorarium not exceeding £5 per annum to the Assistant Secretary.

Other Business.—Mr. Donnelly stated that he had a very important matter to raise. The Department of Agriculture were about to appoint a Professor of Pathology at the Veterinary College of Ireland at a salary of £400 per annum, which was a ridiculously low figure. He also spoke of the low salaries of the other professors and also the lack of equipment at the Veterinary College and stated that this matter should be taken up with the Department of Agriculture.

Mr. Magee expressed the view that these were very serious matters as far as the profession were concerned, and should not be allowed to go by default.

On the proposition of Mr. O'Donovan, seconded by Mr. Magee, the following resolution was passed unanimously:—

"That we view with alarm the position of the Veterinary College of Ireland as regards the insufficiency of the staff and their scale of remuneration and also the great lack of suitable equipment in the College, and we urge the Minister for Agriculture to take steps to have this state of affairs remedied in the interests of the country."

It was decided that a copy of this resolution be forwarded to the Minister for Agriculture.

The following resolution was also passed unanimously and it was directed that copies be sent to the Ministers for Education and Local Government respectively:—

"That we are very strongly of the opinion that the milk supply to all schools and colleges should be from tubercle-free herds; and we suggest that the Minister for Education make this an obligatory requirement for the receipt of Educational Grants."

A third resolution was also passed unanimously, and it was decided that a copy be sent to the Minister for Local Government:—

"That the attention of the Minister for Local Government be drawn to the difficulty experienced by members of the Veterinary Profession in the Irish Free State in obtaining tuberculin for use in connection with tubercle-free herds and that the Minister be appealed to, in the interests of public health, to do all in his power to facilitate the import of a supply of this product."

Professor O'Connor.—It was unanimously decided that the Presentation Dinner to Professor O'Connor be held on Monday, May 4th, 1936, and that the May Meeting of the Association be held on Tuesday, May 5th (the first day of the Spring Show).

It was agreed that the circular *re* the Presentation should include references to (1) Professor O'Connor's services to the profession; (2) his appointment as Principal of the Veterinary College of Ireland, and (3) his magnificent services to the Veterinary Medical Association of Ireland.

Invitations are to be sent to the Minister for Agriculture, the Minister for Local Government and Public Health and to the Secretaries of both Departments (Messrs. Twomey and McCarron), and ladies are to be invited.

Condolence.—A vote of condolence to Mrs. Doyle on the death of her husband, the late Mr. James Doyle, M.R.C.V.S., Blackrock, Co. Dublin, was passed, all members standing.

Election of Officers for 1936

The following officers were elected (unopposed) for 1936:—

President.—Mr. H. O'Leary.

Vice-Presidents.—Professor T. G. Browne and Mr. A. F. O'Dea.

Hon. Treasurer.—Professor T. G. Browne.

Hon. Secretary.—Mr. J. M. Murphy.

Council Election

Messrs. J. A. Flynn, J. E. Kenny and W. E. MacDonald were appointed scrutineers.

The scrutineers reported that for the fifth seat in the Council two candidates received an equal number of votes. After some discussion it was decided that the members present should cast their votes by ballot in favour of one or other of these two candidates. When this had been done and the result announced, the following members were declared elected to Council: Messrs. J. F. Timoney, J. D. Whitty, J. J. Dundon, J. J. Condon and E. V. Kelly.

Induction of President

The Chairman, having declared the election of the above-mentioned officers, stated that his period of office as President had now terminated and that he would have much pleasure in inducting the new President, Mr. Harry O'Leary.

Mr. O'Leary delivered the following address:—

I want to thank you sincerely for the great honour you have conferred on me in electing me as President of this Association for the year 1936, and I shall endeavour to carry out my duties as such to your satisfaction. But, for the Council to make a success of their task and to bring about a successful termination to their year of office, they must have behind them the unanimous support of the whole profession.

The past year is a good example of what can be done by unity and loyalty. The profession must stand together for the common good of all its members, individually as well as collectively. Each member must be prepared even to make sacrifices, and this especially holds good for the younger members of the profession. They must refrain from applying for positions when asked to do so by their Council. If this is not done, we can never hope to succeed in our fight for higher salaries.

I have just returned from acting as judge at a mare show in Wexford and it reminded me of an incident that occurred exactly this time two years ago. I believe there are about ten practitioners in the Free State acting in this capacity for the Department of Agriculture, and each one of us was notified, about a week before the shows were to commence, that they were reducing the salaries by a guinea a day. I immediately got in touch with Professor O'Connor and a meeting was called and the profession was circularised not to accept this reduced fee. The result was that we are still receiving the old fee: but the judges at those mare shows had a different tale to tell, because they had not got an Association behind them to fight for their rights and they were cut half-a-guinea a day.

During the past year increased salaries have been obtained by the Departmental Staff and also by part-time officers all over the Free State, because, when positions were advertised in the Press the salaries for which were considered inadequate, the profession was circularised not to apply for those positions, and in almost every case a reasonable salary was obtained because there were no applicants for them. To my mind, a wrong attitude appears to be prevalent amongst some members of the profession, who are inclined to accept those small salaries offered and work only according to the salary paid, which means that the work is only half done. I believe this is very wrong from every point of view. If the work is to be undertaken at all it should be carried out carefully and efficiently, making it impossible for those who have employed us to carry on without our help. We are practically, I think, in that healthy position at the moment, especially in the cities and towns, where whole-time veterinary officers are employed in the interests of public health. When we are sure of our ground and of the unity of our members, then we can demand a salary in proportion to the amount of work rendered.

The members here to-night—especially practitioners—should try and attend the general meetings and help the Council in their work, because, I am sorry to say, our meetings are badly attended. Members of the Council should make a special effort to attend more regularly, because it is not fair to throw all the responsibility and work on to the few members who do attend. I have only to thank you again, and to express the hope that at the end of my year of office we will have succeeded in achieving even better things for the profession in 1936 than in 1935.

Vote of Thanks to Outgoing Officers.—Mr. H. O'Leary, from the Chair, then proposed a vote of thanks to Mr. Sean O'Donovan, the outgoing President. This was seconded by Mr. Kenny and was passed with acclamation.

Mr. O'Donovan proposed a vote of thanks to the Hon. Secretary (Professor O'Connor) and Hon. Treasurer (Professor Browne), stating that he regretted very much that circumstances did not permit Professor O'Connor to continue as Hon. Secretary. He paid a warm tribute to his work in that capacity for a large number of years. Mr. Magee seconded. The Hon. Secretary (Professor O'Connor) thanked the members warmly and said that he much regretted having to relinquish the office, in

which it had given him so much pleasure to labour for his fellow members. The Hon. Treasurer also suitably replied and made an appeal on behalf of the Veterinary Benevolent Fund.

Election of New Members.—The following new members were unanimously declared elected: Miss Taylor and Mr. W. Joyce (proposed and seconded by Professor O'Connor and Mr. O'Dea respectively); Mr. Mahoney (proposed by Mr. O'Donovan and seconded by Mr. W. E. MacDonald).

J. M. Murphy, *Hon. Secretary.*

In Parliament

The Milk Bill

The Milk (Extension of Temporary Provisions) Bill was considered (the House in Committee) on February 25th.

On Clause 1 (Extension of periods for Exchequer payments),

Mr. Alexander moved to reduce from 18 months to six months the period during which the milk subsidy should be continued. He said it was time they knew what Mr. Elliot's long-term policy was going to be. If they were going on granting public money to reorganise the industry it was essential that there should be a reorganisation of milk production itself.

After debate,

Mr. Elliot, Minister of Agriculture, said that a short term such as the six months proposed would be the sort of thing which would keep the industry in turmoil and increase the risk of another breakdown in the autumn. It was desirable that the Government should have time to consider the Reports of the Committee of Investigation and the Reorganisation Commission, neither of which had yet been received. In so short a period as six months they would not be able to review all the details of the character of the long term policy, which it was hoped would be laid before the House next winter. The improved quality of milk was important, but it was felt that the industry should take the necessary steps to organise the improvement rather than that that obligation should be forced on the industry by provisions in the present temporary Bill.

The amendment was by leave withdrawn and Clause 1 ordered to stand part of the Bill.

Clauses 2 to 6 and the Schedule were ordered to stand part of the Bill, and the Committee stage was concluded.

On the motion for the third reading, on March 2nd, Mr. T. Johnston, who moved the rejection of the Bill, said that since the previous discussions on the Bill there had been a remarkable correspondence in *The Times* on the subject of insufficient nutrition. Nobody in that correspondence denied that at least 10 per cent. of the population was living below the British Medical Association's minimum standard. Sir John Orr had said that almost one-half of the population in our industrial areas were not getting enough to eat, and he mentioned milk as one of the foodstuffs which should be better and more widely distributed. The Minister did not deny that a large proportion of the population was undernourished, and yet he was using public money for the destruction of 27 per cent. of our liquid milk through its diversion to manufacturing purposes. We were spending at least £111,000,000 a year in the treatment of disease, and the policy of organising scarcity in such an essential foodstuff as liquid milk was against the public interest.

Mr. Elliot's Reply

Mr. Elliot said that the enormous importance of fresh food such as milk in the avoidance of disease was a matter of general agreement in the House. His only point of difference with Mr. Johnston was when the right hon. gentleman said that the Government were organising scarcity. The production and consumption of milk had increased greatly in recent years. Mr. Johnston's motion, if carried, would bring the milk in schools scheme to an end. Steps were outlined in the Bill to extend the supply of milk itself as well as that of butter and cheese.

The motion for the rejection was negatived by 242 votes to 110, and the Bill was read a third time.

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Mar. 13th.—Annual Dinner and Dance of the Yorkshire Division, N.V.M.A., at the Guildford Hotel, Leeds.

Mar. 16th.—Meeting of the Editorial Committee, N.V.M.A., at 2, Verulam Buildings, Gray's Inn, W.C.1, 4 p.m.

Mar. 17th.—University of Liverpool, School of Veterinary Science, Dinner and Dance, Reece's Restaurant, Parker Street, Liverpool.

Mar. 18th.—Annual General Meeting of the Western Counties Division, N.V.M.A., at Exeter, 2 p.m.

Mar. 30th.—N.V.M.A. Committee Meetings.

Mar. 31st.—N.V.M.A. Council and Committee Meetings.

April 1st.—R.C.V.S. Annual Fee due.
R.C.V.S. Committee Meetings.

April 2nd.—R.C.V.S. Committee Meetings.

April 3rd.—R.C.V.S. Committee and Council Meetings.

May 7th.—Last day for nominations for election to R.C.V.S. Council.

May 21st.—Voting Papers issued, R.C.V.S. Council Election.

May 28th.—R.C.V.S. Council Election Voting Papers due.

June 4th.—R.C.V.S. Annual Meeting and Luncheon in Edinburgh.

June 11th.—D.V.S.M. Examination begins.

June 24th.—R.C.V.S. Committee Meetings.

June 25th.—R.C.V.S. Committee Meetings.

June 26th.—R.C.V.S. Committee and Council Meetings.

June 29th.—R.C.V.S. Membership Examinations begin.

Sept. 14th-18th.—N.V.M.A. Annual Congress, Scarborough.

PERSONAL

Birth.—Turney.—On March 2nd, to Verena, wife of John T. Turney, Chesterfield, Derbyshire, a daughter.

Will.—Dale, Mr. William, of Coventry, veterinary surgeon (net personalty £9,905), £11,947.

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R.C.V.S. OBITUARY

Jones, William Luther, Apothecaries Hall, Menai Bridge, Anglesey. Graduated Edinburgh, December 21st, 1896. Died February 28th, 1936, aged 60 years.

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GENERAL OBITUARY

Professor Pavlov

We regret to record the death, which took place at Leningrad on February 27th, at the age of 86, of Professor Ivan Petrovitch Pavlov, who occupied a position of the greatest eminence in the scientific world and whose name is known to all veterinary students by reason of his classical experimental work upon gastric digestion in dogs.

Having taken his degree of M.D., in 1883, at the Military Medical Academy in St. Petersburg, Pavlov (states *The Times*) became scientific assistant in charge of work on animal experimentation to the clinician Botkin. He spent two years in Germany under Ludwig and Heidenhain, and in 1891 was appointed director of the physiological department of the new Institute of Experimental Medicine founded by Prince Oldenburg. In 1897 he became professor of physiology at the Military Academy, and in 1907 one of the four scientific members of the St. Petersburg Academy, still retaining his two other posts, so that he was in control of three laboratories. Two of these were conducted by assistants under his direction, but the most important of his own investigations were made at the Institute of Experimental Medicine.

His first important work was on the physiology of circulation. He had come to the conclusion that much experimental research had given misleading results because of the presence of disturbing factors due to anaesthetics, pain, and discomfort, and with endless patience he sought to eliminate these. He trained a dog to allow the insertion of a cannula in a small artery in its knee. This and animals used in later work he kept in his own house, tending them himself and letting them be petted by his wife and children. His observations were made on animals in a completely contented frame of mind and body, so that the effects of the experiments he made were not vitiated by extraneous influences. The first set of experiments led to novel results as to the influence on blood pressure, of digestion and the inhibition of large quantities of fluid.

The next and more fruitful work was on digestion. He was able to make fistulous apertures into the stomach and œsophagus, and to maintain these while the animal recovered to a normal condition. He was thus able to obtain pure gastric juice, and to work out the whole process of secretion and the mental and physiological stimuli which induced it. These researches reformed all notions of the processes of digestion, and are the foundation of modern knowledge of the subject.

The experiments on digestion led him to the third phase of his investigations. He had found that the secretion of saliva and of gastric juice followed as reflexes when tasty substances were placed in the mouth of a hungry dog. But it was possible to associate a stimulus affecting a higher centre of the brain with the reflex, as for instance when the introduction of the gustatory substance was accompanied by the ringing of a bell. After some weeks or months of practice the secretion of saliva or of gastric juice could be produced by the sound of the bell without the presence of the tasty material. The reflex had been moved up into the brain and a psychological link had been interpolated in the physiological chain. Pavlov carried his experiments in this direction much farther, and came to the conclusion that in certain cases these "conditional reflexes" could be transmitted to the next generation.

In common with other scientists in Russia, Pavlov suffered much during the years of revolution and civil war, having to carry on his experiments under conditions of the greatest difficulty, but with the introduction of the New Economic Policy all was changed and Lenin personally saw to it that Pavlov's laboratory was furnished with all that he required. His work on conditioned reflexes continued until his death, and was popularised in the Soviet Union by an excellent film of his experiments. On his eighty-fifth birthday the Government gave him a million roubles for the extension of his laboratories, and an annual pension of 20,000 roubles.

Pavlov received many distinctions from foreign universities and academies, and was a foreign member of the Royal Society. In 1923 he visited Great Britain and the United States, and he attended the Neurological Congress in London last summer. He was Nobel Laureate in medicine and physiology in 1904, and received the Copley medal of the Royal Society in 1915. In 1928, on the occasion of the Harvey tercentenary, he was made an honorary Fellow of the Royal College of Physicians.

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VETERINARY INSPECTION IN BEDFORDSHIRE

The Bedfordshire Agricultural Committee spent some time at a recent meeting in the consideration of resolutions from the Public Health Committee and a report of the Medical Officer of Health and County Veterinary Officer as to the appointment of full- or part-time veterinary surgeons to perform the various duties required in the inspection of herds, milk, etc.

The question came before the committee in November and the proposed appointment of full-time officers was referred back by the County Council for further consideration.

Three proposals were now put forward for consideration: (1) the setting up a full-time veterinary service; (2) the appointment of a chief veterinary officer with an assistant, both to work with the local part-time officers, and (3) the county veterinary officer to work with the part-time veterinary officers on the present lines. After much discussion the second proposal was adopted.

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LEGAL NOTES

Animal Dealer sent to Prison.—At Oxted (Surrey) Police Court on Monday of last week Cyril Joseph Cooke, 33, described as a livestock dealer, of Redwood Bungalow, Godstone Road, Caterham, was sentenced to two terms of six months' imprisonment with hard labour—the sentences to run consecutively—and fined £100 on two charges of obtaining credit by fraud. Eight similar charges were taken into account. Cooke pleaded "Guilty" to the ten charges and asked that 78 similar offences, and also a charge of causing unnecessary suffering to a dog, should be taken into consideration.

Mr. G. J. Ball, for the Director of Public Prosecutions, said that Cooke was released from prison on July 5th of last year, having served six months' imprisonment for an exactly similar fraud. His procedure was to advertise in weekly papers all over the country offering to purchase dogs, cats, rabbits, frogs, birds, guinea-pigs, and other animals, by this means inducing people to send animals under the pretence that he would pay for them. He had defrauded miners from South Wales, labourers in Yorkshire, blacksmiths, painters, and other poor people all over the country, who had, he supposed, tried to supplement their slender incomes by doing a small trade in dogs and other animals. The Director of Public Prosecutions had consented to the case being dealt with summarily to avoid the very heavy expense and hardship of bringing these people from long distances to attend the Court.

Mr. Ball said that they did not know exactly what had become of the animals, but in books found at Cooke's house they came across a list of hospitals, laboratories, and institutions in various parts of England, Scotland and Ireland. Apparently Cooke got in touch with porters and other subordinates of these institutions and sold animals to them.

"Broken-Winded" Hunter: Damages for Breach of Warranty.—At the Faversham County Court on Monday, February 17th, before his Honour Judge Clements, Thomas Percy Croysdale, of Gays House, Holyport, Berks, sued Miss Simpson, of Berkeley, Dunkirk, for rescission of a contract over the sale of a horse and the return of £45, or alternatively for a breach of warranty. After some legal argument it was agreed to drop the rescission part of the action and confine it to one of breach of warranty.

Plaintiff stated that in October, 1935, he was anxious to buy a horse for hunting, and after conversation with a Mr. Harvey he went to see defendant. The mare in question was brought out of the stable and it was ridden by Mr. Harvey and himself. He asked defendant if the horse's wind was all right and she said: "Yes," and her groom agreed that they had never had any trouble with the horse's wind. Witness said he would like to have a veterinary surgeon's certificate, but Mr. Harvey said the horse seemed to be all right and that it would be a waste of money. Defendant said she could not have the horse galloped for wind as it was only just off the grass. He bought the horse because he believed it was sound in wind. After the horse was delivered he rode it and found that it coughed.

Two veterinary surgeons gave evidence before the closure of the plaintiff's case. The first, Mr. R. A. Murless, stated that on November 11th he was called in to examine the mare and he certified that she was suffering from broken wind, exhibiting double action in the flanks. Undoubtedly this condition was present on October 1st. The disease must have been present for six months.

Mr. William T. Ferguson, M.R C.V.S., of Slough, stated that he examined the mare on February 12th last and found it was suffering from a chronic cough and was broken-winded. There was also double action of the flank. The disease was in an advanced stage. He should say the disease was present on October 1st.

Defendant stated that she thought the mare rather old for stag hunting but found nothing to complain of regarding the mare's performance: she used her up to the end of March, 1935. The first week in May the mare was turned out to grass. When plaintiff came to see the horse she had been on the grass for 4½ days. Plaintiff asked about the mare's wind and witness told him that as far as she knew the wind was all right. Ten minutes after plaintiff had agreed to buy the horse she advised him to have her examined by a veterinary surgeon, but he said it was not necessary. She was very clear that she suggested having the veterinary examination. She asked her groom if the mare's wind was all right and he nodded his head and said he thought it was. The first complaint she had from defendant was from November 5th to 10th. She did not think the horse was broken-winded when she sold it. She suggested that the horse went into an infected horse box and caught this cough.

Mr. Ernest Morgan, M.R.C.V.S., of Faversham, stated that if the horse was slightly broken-winded when plaintiff examined her he could not understand her not coughing in his presence. Double action breathing would be apparent to anyone used to horses.

Mr. Duncan, for the defendant, submitted that she gave no warranty at all.

The Judge said that every one of the witnesses had given evidence very fairly and there was no possible doubt that each one came there to assist the Court. In January, 1935, Miss Simpson purchased the mare and had it examined by a veterinary surgeon who said it was sound in wind, and she hunted it for one season and then put it out to grass. It was clear to his mind that she and her groom were under the impression that the mare was sound in 1935 and remained so until it was sold to plaintiff, but as a fact he found that she was not sound. That question had been contested and defendant and her groom thought the horse was sound on October 1st, but upon the evidence given by the veterinary surgeon there must have been something the matter with her, and no doubt she was broken-winded. One had, as far as possible, to come to a conclusion as to what was in the minds of people. It was clear plaintiff wanted to know if the animal was sound in wind and in defendant's mind it was sound in wind and a good hunter. She was convinced of it when she wrote plaintiff on November 14th and it might be she was convinced of it now. No one realised more than he did why one must be chary of pinning people down to their exact words, but whatever words were used the intention was to convey to the mind of the plaintiff that the mare was sound in wind, but she was not. In these circumstances he was satisfied that the mare had seen the best of its days and that it could only be used for light work on a farm, and he should award plaintiff damages for £40 and costs.

Hungry Horses: Riding Master Fined.—Before the Salisbury County Magistrates, Nigel Seaton Stedham, of Laverstock, was summoned for causing unnecessary suffering to five horses by unreasonably omitting to provide them with sufficient nourishing food and proper care and attention, at Laverstock and Ford, between January 17th and 24th.

Mr. Gordon Jones prosecuted for the R.S.P.C.A., and Mr. M. Trethowan appeared for the defendant and pleaded not guilty.

Mr. Jones said the defendant was a riding master, and some little time before Christmas he put five horses in a field at Laverstock. There was then a fair amount of grazing, but as the horses continued to eat the grazing grew bare, and as the weather got worse so the

grazing deteriorated. Eventually the field became flooded over a considerable part of its extent, and the herbage, which had been cropped, had disappeared to such an extent that there was no food value left. Observation was kept on the horses, and it was found that they were only visited and fed at infrequent intervals. They were reduced to such a state that they were obliged to seek all kinds of things to supplement the small amount of food given them. One kind-hearted man, living near, seeing the condition of the horses, gave them hay and oats, and the position was that about January 17th and onwards, when the condition of the horses was being particularly noticed, they were not in too bad a condition. A chestnut and a black hunter were in a decidedly poor condition, a bay pony was in fair condition, and two other ponies were in good condition.

That was a case, continued Mr. Jones, which had to be decided on common sense. At one period the horses got out of the field—he alleged, in search of food—and hurdles were placed over the hole to keep them in. Ivy was growing on a wall, and the horses had eaten bare 20 yards of the green part, and they actually ate the stems. Would horses in a normal condition do that? The wall was roofed with old musty thatch, and the horses had even eaten the thatch. The hurdles were interlaced with twigs, and the horses had eaten the twigs, leaving only the framework of the hurdles. They had also eaten twigs from the trees, and were seen standing in the flood water reaching up and eating them. Defendant was interviewed and made a statement, the substance of which was: "These horses are not too bad, they are not starving, or they would not be in the condition in which they are. I have fed them sufficiently to my knowledge. The reason one of the horses is in a bad condition is because it is a 'crib-biter.'" This horse was watched, and it was found that whilst the other horses were eating the twigs it was not doing so.

Evidence bearing out the allegations made by Mr. Jones having been given by an R.S.P.C.A. inspector and other lay witnesses, the defendant stated that when the animals were turned out the feed in the field was quite sufficient to keep them, but later he gave instructions to the stable-boy to feed the horses whenever it was cold and whenever there was any need. From January 1st to the 24th threequarters of a ton of hay was fed, which worked out at 16 lb. a day per animal, which was sufficient, considering that two of the animals were ponies. He knew for a fact that the horses were fed on January 17th, 19th and 22nd. The samples of hay fed, produced in court, were not fair samples of the hay fed to the horses. There was only one "crib-biter" in the field, but other animals would copy such horses. He had seen horses well fed and perfectly fit come out of the stable and eat ivy.

Mr. E. R. Harding, veterinary surgeon, said he examined the horses on January 24th. Two were rather thin, but they were both aged, and he considered that one was a "bad doer." The other two were in moderate condition, and the pony was in good condition. It was to be expected of a "crib-biter" that it would do the things described, and when other horses had been turned out for some time and had done no work they also chewed twigs and the bark of trees. The horses did not give him the impression of being starved, and they looked as if they had had sufficient food. Sixteen to 20 lb. of hay, with a little pasture, would be sufficient feed for a day for a horse. The eating of the manure did not signify that the horse was hungry. It was a habit, but it was not common.

The Chairman said the Bench had come to the conclusion that these horses were treated not quite as they should have been inasmuch as there had been neglect which had caused unnecessary suffering. There would, therefore, be a conviction, but they did not consider there had been any wilful cruelty. There would be a fine of £1 and two guineas costs. Some of the Bench had had 50 years' experience of horses, so they knew what they were talking about.

Cattle Smuggling Prosecution: Onus of Proving "Guilty Knowledge".—An important decision relating to "smuggling" prosecutions was given by the Ulster Divisional Court recently, when it was declared by the Lord Chief Justice and Mr. Justice Brown that the onus of proof that a defendant knowingly harboured uncustomed cattle lay upon the Crown. The matter came up by way of a case stated by the Loughgall magistrates, who had fined Samuel Gass, a farmer of Markethill, County Armagh, £151 10s. for "knowingly harbouring five uncustomed cattle with intent to defraud Revenue authorities."

The farmer's case was that he did not know the cattle were uncustomed, and the Court was asked to state whether the magistrates were right in law in holding that the onus of disproving guilty knowledge lay upon Mr. Gass.

The Court decided in favour of the farmer, and ordered the case to go back to the magistrates, the Lord Chief Justice stating that the British Finance Act, 1934, did not shift the onus of proving guilty intent from the shoulders of the Customs Commissioners. His Lordship instanced the case of a man charged with being knowingly in possession of stolen goods, and said that he could not be convicted until it was proved that the goods were stolen.

Sheep Scab Prosecutions in Essex.—Giving evidence in a case recently heard at Southminster Petty Sessions, when a Burnham-on-Crouch farmer pleaded not guilty to a summons alleging he failed to notify the existence of sheep scab in 19 sheep on his farm at Great West Wycke, Burnham Marshes, Superintendent Day said that when veterinary officers of the Essex County Council visited Great West Wycke they found 17 ewes and two rams to be badly affected with sheep scab. The affected ewes were in a bad condition, and the most inexperienced person could have told that the animals were suffering from some skin disease.

Mr. Frederick Medlock, chief veterinary officer of the Essex County Council, spoke to visiting the farm, where he saw the sheep which were obviously in distress and suffering intense irritation.

Defendant stated that he went away for a holiday on December 21st last, and was away until the day the officials visited his farm. In his absence the sheep were in the care of an experienced shepherd. His defence was that he did not know the sheep had sheep scab.

Defendant was fined £4 15s. The police did not ask for costs.

In a similar case at Purleigh, Mr. Philip Harvey, a veterinary inspector of the County Council, said he visited defendant's farm and found out of a flock of 60 sheep 16 visibly affected with scab. Inspector J. G. Smith said he pointed out to defendant that sheep scab was

notifiable. Defendant replied: "I thought it was fly." Witness added that during the past four months every farmer had been notified of the regulations regarding sheep scab.—Defendant was fined 10s. in respect of each of the 16 sheep.

Zoo Owner's Libel Suit.—Judgment for £50 damages was entered by Mr. Justice Finlay at Kingston Assizes in favour of Mr. Reginald Stewart Goddard, the proprietor of the Chessington Zoo, against Lady De Grimston, a vice-president of the R.S.P.C.A.

Mr. Goddard alleged that he was libelled and slandered by Lady De Grimston regarding the condition of penguins and a tigress kept at his Zoo.

The special jury found for Mr. Goddard on the issue of libel but found that there was no slander.

It was stated that at no time had it been Mr. Goddard's intention to make any profit out of the action, but if he did so he would give every penny of it to the Royal Veterinary College.

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TROPICAL MEDICAL RESEACH COMMITTEE

On Wednesday last it was announced that the Medical Research Council, in consultation with the Colonial Office, has decided to appoint a Tropical Medical Research Committee for the purpose of advising and assisting in the direction of such investigations as the council may be able to promote, whether at home or abroad, into problems of health and disease in tropical climates, and of making suggestions generally as to research in this field.

The committee, which will be a purely scientific body, will include representatives of the Colonial Office and of the Liverpool and London Schools of Tropical Medicine, with other members appointed as individual experts in tropical medicine or in different branches of medical science. The following will serve in the first instance: Professor J. C. G. Ledingham, C.M.G., F.R.S. (chairman), Professor A. J. Clark, M.C., F.R.S., Dr. N. Hamilton Fairley, *O.B.E.*, Professor W. W. Jameson, Dr. Edward Mellanby, F.R.S., Dr. Muriel Robertson, Major-General Sir Leonard Rogers, K.C.S.I., F.R.S., Dr. H. Harold Scott, Sir Thomas Stanton, K.C.M.G., Dr. C. M. Wenyon, C.M.G., F.R.S., Professor Warrington Yorke, F.R.S., and Dr. A. Landsborough Thomson, C.B. (secretary).

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ARMY VETERINARY SERVICE

London Gazette—War Office—Regular Army Reserve of Officers

Feb. 28th.—Maj. T. Lishman, having attained the age limit of liability to recall, ceases to belong to the Res. of Off. (Feb. 27.).

Regular Army

Mar. 3rd.—The follg. Lts. to be Capts. (Mar. 3): D. I. C. Tennant, J. L. Dalzell.

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IRISH HORSE BREEDING COMMISSION

Important Recommendations

The Commission of Inquiry into the Horse Breeding Industry, which was opened by the Irish Free State Government in August last and before which a number of veterinary surgeons gave evidence (*Vet. Rec.* 15. 44.) issued its report on February 28th. Included amongst the recommendations is a proposal that the Royal Veterinary College of Ireland should be greatly enlarged and equipped in a more up-to-date manner.

The Commission finds that while the number of thoroughbreds bred in the Free State has remained stable the quality has shown a distinct falling off. The first recommendation to combat this decline is that the Government should purchase ten stallions, three of the first class costing £20,000 to £30,000 each, the remaining seven of the second class costing £2,000 to £10,000 each.

It is also recommended that income-tax on stallions' fees should be abolished, privately owned racecourses should be amalgamated with the Turf Club or some such body, the expenses of running a horse should be reduced as much as possible, the licence of the Totalisator Board should be extended to enable it to form pools on English races, no more bookmakers' licences should be granted, and that the cost of a licence should be increased.

The Commission finds further that there is an alarming diminution in the number of high-class hunters bred in the Free State during the last few years. To renew the stock it recommends the appointment of a purchasing committee of three to inspect all hunter sires and purchase sires to replace those found unsuitable, in addition to 20 thoroughbred sires for the districts which were once notable breeding centres. Farmers and hunter breeders should be encouraged to keep the proper type of brood mare. The Commission recommends with this end in view the adoption of a scheme of premiums for farmers or small breeders who show sound mares at county agricultural shows. It holds that the Government ought to look favourably on hunting, that income-tax should not be assessed on the income of *bonâ fide* hunt clubs, and that entertainment tax should not be levied on entertainments designed to raise funds for a *bonâ fide* hunt.

Other recommendations are that the Irish draught horse is the type to be encouraged, the Connemara pony should be fostered, and that the Government should collaborate with the Royal Dublin Society in a more extensive campaign for the horse show and its sales. The Commission strongly recommends the creation of an advisory council.

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SAFEGUARDING HORSE RIDERS' INTERESTS

It was reported at the third annual meeting of the Surrey and Adjacent Counties Riding Association that agreements were concluded with Banstead Common Conservators, Esher Council and adjoining authorities. In the near future bridle tracks across the major portion of Surrey commons would be signposted and the complaints against indiscriminate riding on footpaths accordingly lessened. The survey of the county bridle ways was carried on continuously, but the anticipated revision in the rider's code of the clause relating to the rule of the road did not transpire. The rider's point of view submitted to the Minister of Transport regarding the Highway Code resulted in it being left to the rider to proceed with due consideration to his personal safety and according to the circumstances. The abnormal period of rain and the increase of riding establishments in the Richmond Park area had inevitably led to the curtailment of riding hours. The local committee considered the situation and representations made to the Office of Works resulted in a better understanding of the position and a marked improvement in riding amenities and conditions.

Reporting on a satisfactory financial position, the Chairman of Committee said that, having regard to the fact that the association had estab-

lished itself and was accomplishing good work for the riding community in general, it was to be hoped that the members would continue to give their support in every way.

Sir Frederick Hobday (principal of the Royal Veterinary College) gave a lecture, "Modern Veterinary Practice," which was illustrated by slides and a film.

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Corrigendum.—In the abstract of the article by F. C. Minett, "Staphylococci from animals, with particular reference to toxin production" (*Vet. Rec.* **16**, 9. 243), the second sentence in the third paragraph should read: "There appears to be a relationship, however, between the strength of toxin produced and the type of lesion set up."

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MILKING MACHINES AND THEIR RELATIONSHIP TO MASTITIS IN COWS

A report on this subject was recently made by the Research Institute of the Royal Veterinary College, London, to the Research Committee of the Royal Agricultural Society. In the course of this report it is stated that a self-contained herd of some 130 Ayrshire cows producing certified milk has been under constant supervision by the Institute for about five years. During this time only a very small proportion of the cows have been affected with the ordinary chronic and contagious form of streptococcus mastitis. There have, however, been very numerous cases of acute mastitis the immediate cause of which was a streptococcus known to be different from that causing the chronic form. These acute cases have involved the owner in considerable loss. For some time it has been suspected that the fault lay with the milking machine, although the exact reason was not clear. The owner was urged to milk at least part of the herd by hand, but owing to the increased labour costs which would have been entailed he was unable to do this. A few months ago, after consultation with the makers of the machine, it was decided as an experiment to reduce the milking vacuum from 15 to 13 inches. The effect of this was to increase slightly the milking time, but so far as mastitis is concerned the effect has been dramatic. Since the change-over three months ago no further cases have appeared, whereas during the previous nine months at least 21 cases were known to have occurred.

"For practical purposes," proceeds the report, "the evidence indicating that the trouble was due to mishandling of the machine appears to be sound. It should be mentioned, however, that at the time of the change-over the owner decided on his own account to have the teats of each cow dried with cotton wool immediately after milking. Thus, from the scientific point of view he introduced into the evidence an interfering factor, although one may well be somewhat sceptical of the importance of this factor in connection with the results achieved.

"The present opportunity may be taken to re-state another fact concerning mastitis and milking machines. In the past it has been quite a common experience that the installation of a milking machine into herds which had previously been milked by hand has been followed by an 'outbreak' of mastitis. Owners have quite naturally blamed the machine for causing or spreading the mastitis. Undoubtedly, however, the truth is as follows. The ordinary chronic form of mastitis is widespread in many herds and many of the cows are affected in a sub-clinical way, that is in a way which is not detectable by casual examination of the udder or milk. So long as the cows are milked by hand such infections may remain sub-clinical for long periods, but with a change in the method of milking they are liable for a time to become clinically apparent. If the udders are really healthy, the altered system of milking will have no ill-effect, providing, as it now appears, the vacuum used is not excessive. Obviously, then, if the installation of a machine is contemplated, steps should be taken to have a small sample of milk from each cow examined in a laboratory. The machine should then be used on the healthy cows only and those found to be infected should be milked by hand pending disposal in the normal course. Should the proportion of infected cows be high, it might be permissible to milk them by separate units of the machine, provided this is done with great care. In this connection it is probably of the greatest importance that the vacuum used should be as small as possible and that the cups should be removed from the teats immediately milking is completed."

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THE CYTOLOGICAL EXAMINATION OF MILK

"The microscopical examination of milk for tubercle bacilli is preferable to the biological test in so far as it is simpler and quicker," observes *The Lancet* in a leading article on the above subject, and proceeds: "Unfortunately these advantages are counterbalanced by the fact that the organisms cannot be seen in milk under the microscope unless present in enormous numbers. According to D. R. Wood[1] the microscopical test is 500 times less sensitive than the biological; estimates of the same order have been made by other workers. Such comparisons refer to the classical method of examination which consists in laboriously searching smears of milk deposit under the oil-immersion lens for acid-fast bacilli; and the weary observer derives little comfort from the reflection that the finding of such organisms carries no assurance that they really are tubercle bacilli and not saprophytes. More recently attention has been turned from the direct examination of films for acid-fast organisms to the study of the cells found in milk and their relation to tuberculosis. H. L. Torrance[2] drew attention to the occurrence of certain more or less characteristic groups of cells to be found in tuberculous milk. Other workers have confirmed these findings, and S. T. Cowan and L. Maddocks[3] now report the results of a careful study of the cytology of 229 samples of milk from single cows. If centrifuge deposit is spread in a thin film and stained the cells are for the most part distributed uniformly over the whole surface; but here and there clumps of cells are encountered. These may be composed of endothial cells, non-endothelial cells, or of a mixture. Cowan and Maddocks found that whilst such cell groups might be present either in tuberculous or non-tuberculous milk, more of them, particularly of the endothelial type, were observable in tuberculous milk. It was also found that in tuberculous samples acid-fast bacilli showed a tendency to collect near the cell groups; bacilli lying far away from these groups were more likely to be non-pathogenic ones. Thus a large surface of a smear may be looked over rapidly under a low magnification,

[1] *The Analyst*, 1931, lvi., 179.
[2] *Veterinary Rec.*, 1922, ii., 289, and 1927, vii., 875.
[3] *Jour. Path. and Bact.*, 1935, xli, 373.

and the areas containing endothelial cell groups can then be subjected to examination for the presence of acid-fast bacilli under a high magnification. The 229 samples examined in this way by Cowan and Maddocks were also tested on guinea-pigs. From 38 of them tuberculosis was produced in these animals, in seven of these cases the degree of contamination being slight if judged by the extent of the lesions produced. By microscopical examination acid-fast bacilli associated with cell groups were found in 21 samples. None of the seven lightly contaminated samples was detected in this way. In two samples acid-fast bacilli were found unrelated to cell groups, and were given a preliminary label of saprophytes, this diagnosis being confirmed later by guinea-pig inoculation. Tubercle bacilli were never found in the complete absence of cell groups and only rarely in association with groups containing no endothelial cells. No positive results were obtained by microscopical examination which were not confirmed by biological test. It emerges that attention to the cytological picture is a most useful preliminary to the microscopical examination of samples of milk from single cows, for evidence of contamination by the tubercle bacillus increases considerably the proportion of positive results obtained. Even in its improved form, however, this method is not sufficiently sensitive to justify the omission of guinea-pig inoculation, while when bulk milk is being tested it is of very little value.

"The cytological study of milk is not confined to the diagnosis of tuberculosis. Attempts have also been made to diagnose other forms of mastitis, in particular the economically important streptococcal form, by this means, but the value of the method is still in dispute. In extreme cases no difficulty arises; milk containing enormous amounts of leucocytic deposit clearly comes from an abnormal udder, whilst a sample which contains no leucocytes has probably come from a healthy udder. In intermediate cases interpretation of findings is more difficult, for it has frequently been noted that in milk from healthy udders the cell count may be high during the late colostral period and when drying off, though low at other times. It is thus necessary to have a full history of the cow from which the sample comes. Where milk from several cows has been mixed the high cell content of one fraction may be cloaked by dilution with normal milk. A differential cell count is of far greater value than a total count in judging the quality of milk. A high cell count including erythrocytes, monocytes, eosinophils, or pus cells showing phagocytosis suggests inflammatory changes, whereas desquamated epithelial cells, round cells, and neutrophils are less significant. Differential counts are, however, tedious to carry out and require considerable experience, whilst the dilution factor still comes into play.

"One of the most serious defects of the cytological examination of milk as a diagnostic measure is that even where inflammatory exudate can be demonstrated, evidence is still lacking as to the cause of the inflammation, except on the comparatively rare occasions when it is possible to demonstrate the causal organism microscopically. Inflammatory exudate may be found in cases of mastitis, due to the tubercle bacillus, the streptococcus, and the staphylococcus as well as in other less important types of mastitis. Of these infections, contamination of milk by *B. tuberculosis* is of course a danger to public health. Streptococcal mastitis is of importance from the point of view of health of the consumer only in so far as such infection may affect the nutritive quality of the milk; but from the economic aspect such infection is of immense importance to agriculture. Staphylococcal mastitis is relatively unimportant economically but may have a public health significance. The significance of the mastitis, in short, depends on the nature of the causal organism, which for the most part can only be ascertained by resort to other methods. The microscopical examination of milk may sometimes prove a useful and a rapid aid to diagnosis, particularly in tuberculous and occasionally in other types of mastitis, but such an examination is not an adequate substitute for cultural or biological tests."

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MILK CONSUMPTION IN AN OUTER LONDON SUBURB

Dr. E. H. R. Smithard contributes to *The Lancet* an account of the results obtained from a study of the milk consumption in the area administered by the district council of Southall-Norwood, the health department of which instituted an investigation into the safety or otherwise of all milk consumed in the district. The primary object of this investigation was to see if sufficient of the milk consumed was "safe" to warrant confining the council's payments to retailers who sold safe milk; the results (says Dr. Smithard) may be of more general interest in showing the amount of milk consumed in an average London suburb. The author summarises his results thus:—

1. The milk-supply of an outer London suburb with 50,000 population is analysed.
2. The milk consumption per head is just under 0·5 pint daily.
3. The amount of efficiently pasteurised milk sold is 82 per cent. of the whole.
4. The amount of "safe" milk sold is at least 86 per cent. of the whole.

Commenting on these results, Dr. Smithard observes: "Much opposition has been experienced from time to time by local authorities in obtaining powers for compulsory pasteurisation of milk. This has usually been based on the alleged rights of small traders, cost of plant, etc. The figures quoted in this communication are probably typical for any part of the metropolitan police area (covering 8,000,000 people) and indicate that there are in fact very few retailers who do not sell either pasteurised or otherwise safe milk, and that the total quantity of pasteurised or otherwise safe milk sold is a very high proportion of all milk sold. The time probably is at hand when standing committees on private bills, or even the Ministry, may be persuaded more easily to accept the principle of compulsory pasteurisation for all milk which is not otherwise bacteriologically controlled."

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MRS. REES-MOGG'S FRIESIAN HERD: COW'S PHENOMENAL YIELD

In the course of the 17th annual report presented by the Committee of Management to the annual meeting of the Warwickshire Milk Recording Society, it is stated that returns were sent to the Ministry for 106 herds with a total number of 2,877 cows and heifers, of which 1,438 were cows in the herd for the full year. The average yield of cows in milk for the whole year was 7,697 lb.—an excellent average, and above that of three previous years. Friesians again took pride of place, Mrs. Graham Rees-Mogg heading the list with nine cows averaging 14,308 lb.

The cow giving the highest yield also came from Mrs. Graham Rees-Mogg's herd, Clifford Chambers Freasin giving 21,373¾ lb. of milk (nine tons) in 365 days.

Mr. Wilson Ismay's Ruby was second with 21,216¼ lb., Mrs. Graham Rees-Mogg's Clifford Chambers Enid third with 19,107½ lb., and Mrs. Graham Rees-Mogg's Clifford Chambers Diana fourth, with 19,104½ lb.

We note that at this meeting it was decided to send a message of condolence to Vety.-Colonel Graham Rees-Mogg, who has undergone a serious operation from which, however, we are glad to say, he is making a satisfactory recovery.

Correspondence

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

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VETERINARY SERVICE, PRESENT AND FUTURE*

To the Editor of The Veterinary Record

Sir,—I should like, if I may, to express my sympathy with Mr. Hugh Begg who, if my diagnosis is correct, is suffering acutely from the "venom of suspicion," the symptoms manifested being a profound misconception of the present situation, an unhealthy distrust of anyone who does not share his sickroom and a marked reluctance to accept medicine in the form of advice offered him by fully qualified general practitioners, whether it be palatable or unpalatable.

I would, however, like Mr. Begg and those other specialists who suffer from the same disease to see if the following, which has been prescribed for them by a large body of "so-called practitioners," will relieve their symptoms.

"All the meetings having been held and resolutions come to" (to quote Mr. Begg) it was decided

(1) "That a letter be sent to the Chief Veterinary Officer in each county, having appointed such an officer, expressing the willingness of all practitioners in that county to co-operate with, and work under the supervision of whole-time veterinary officers in the area."

(2) "That the foregoing resolution be forwarded to the other regional meetings of the Society to be held during the present month in order that it may be examined thereat, and the proof and amended proofs returned to the Hon. Secretary prior to forwarding the agreed resolution to the N.V.M.A."

(3) "That the resolution should be sent regionally to County Councils in areas where it is approved in its present form."

These resolutions—which, Mr. Begg, were uninspired—were proposed and seconded from the "body o' the kirk," carried unanimously, at the first meeting which this Society held at the Holborn Restaurant on Monday, February 17th, and were later unanimously endorsed at every meeting of the Society.

The resolutions were in every case put at the end of the meetings after the Society's policy of conciliation, co-operation and co-ordination had been thoroughly discussed and may I point out, Sir, that this policy has increased our membership in the last fortnight from 304 to over 420. As an example of the profound misconception which appears to exist as to the intentions of the Society of Veterinary Practitioners, may I quote extracts from two letters received during the last fortnight, from a very prominent member of the Society of Veterinary Officers? In the first of these letters, which was couched in very strong terms, he implored me "not to foment trouble"; but in the second letter, after the aims of the Society had been explained to him, he writes, "I do humbly apologise for doubting your intelligence and integrity. The sentiments you expressed to me are those of the statesman Begg was looking for. If and when you get what you told me published as the policy of your Society, perhaps you will regard my application for membership as the '*amende honorable*.'" Mr. Begg please note!

The truth and irony of the third last paragraph of Mr. Begg's letter is too eloquent to need discussion, but may I just once again reiterate that the Society of Veterinary Practitioners does not wish, nor does it contrive "the alienation of those professional brethren who, more than any Association, could further their interests."

Finally, Sir, may I endorse and return to Mr. Begg for his own reflection and edification the penultimate paragraph of his letter: "Intense stupidity characterises so much that is being done that one cannot avoid the conclusion that the Association should seriously consider its trend and reconstruct its programme with the object of securing the goodwill and help of all sections of the profession."

Yours faithfully,

H. W. Steele Bodger,
Hon. Secretary, Society of Veterinary Practitioners.

28, Lichfield Street,
Tamworth.

March 2nd, 1936.

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To the Editor of The Veterinary Record

Sir,—From the trend of remarks appearing in your columns, and heard at various meetings all over the country, one gathers that our house needs setting in order. But before you can set a house in order you must find out where the defects lie. So far no one seems to have discovered this. Whole-time men blame the general practitioner, the general practitioner blames the whole-time man and they contend between themselves and the house becomes more dilapidated still.

The defect lies not inside the profession but outside it. Both branches are being made light of by a great force—greater than the R.C.V.S. or the N.V.M.A. That force is the British public. Public opinion has demanded inquiry into and legislation concerning animal health as it affects the public: and these demands are justified.

The "powers that be" heard that call and answered it while our little profession slumbered on or smiled sarcastically. The powers started arranging things, and like all laymen who try to

*It is perhaps desirable that contributors to the correspondence appearing under this heading should be reminded that there is a committee of the N.V.M.A. endeavouring to discover the influences underlying the alleged uneasiness within the profession and, furthermore, that the N.V.M.A., some years ago, put forward a "National" scheme for co-ordinating the veterinary services of the country. Copies of the scheme can be obtained upon application to the General Secretary, N.V.M.A.

manage professional matters, they made a mess of it. Those members who saw the need for organisation found themselves being dictated to by the laymen, who are unacquainted with the requirements of professional etiquette.

What we, as a whole, must do is to secure these high places of bureaucracy for duly qualified veterinary surgeons who understand the needs and desires of that body of people who, in the main, desire the peace of co-operation and who carry as their motto "*Vis unita fortior.*"

Yours faithfully,
N. Robt. Turnbull.

45, Redcliffe Gardens,
London, S.W.10.
February 25th, 1936.

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To the Editor of The Veterinary Record

Sir,—Having read the many letters in your paper on the rights of whole-time and part-time appointment holders and the general practitioner, many of which seem to have an antagonistic tone, and others to contain grossly exaggerated statements, it would be pleasing to see in print some definite suggestion as to the lines most suitable of adoption for the benefit of the profession as a whole.

I gather from these letters that it is an accepted fact that there is a necessity for both whole-time appointment holders and general practitioners.

At the present time, our profession stands to be told its duties by County Councils, Boroughs and other bodies of laymen who do not understand professional etiquette or the range of veterinary knowledge.

The ruling body of our profession is the Council of the R.C.V.S., headed by the President. May I put forward as a suggestion that the lot falls on his shoulders of taking the lead in forming a Board or Bureau to be recognised by Parliament, to whom politicians and all bodies concerned can refer and upon whom they can rely to control veterinary matters of "State importance" and advise them of the best means of putting their ideas into operation.

The Board should consist of experienced whole-time men, part-time men and practitioners in both large and small practices; NOT laymen.

The Board should be in a position to:—

(1) Select candidates for public appointments.

(2) Handle the question of clean milk and the tuberculin testing of herds, which at the moment is under jurisdiction of at least two bodies, *viz.*, Ministry of Health and Ministry of Agriculture.

(3) Consider the advisability of leaving some posts open for older general practitioners, who are beyond the hard graft of general practice and yet are dependent on their qualifications for a livelihood, and to see that younger applicants have had sufficient experience in general practice.

(4) Consider ways and means of establishing one or more laboratories to which members may apply for help, both of an advisory and diagnostic nature.

If these suggestions serve but to stimulate further suggestions they will not have been made in vain.

Yours faithfully,
G. W. Searles.

West Street,
Alresford, Hants.
Febrtary 26th, 1936.

To the Editor of The Veterinary Record

Sir,—It would appear from the gist of the correspondence in your columns that the general practitioners are putting forward their own candidates for election to the Councils of the R.C.V.S. and N.V.M.A. with the object of annihilating all whole-time representation on these Councils.

The idea is absurd, and the interest now awakened in these matters shows a healthy spirit. The general practitioner is out not only to safeguard his own legitimate interests, but to endeavour if possible to put the whole-time men on the basis on which they should be placed, but are not in many districts.

There must be whole-time men, who should have control of *all* veterinary matters, but the present control exercised over them by Agricultural Organisers and local bodies, must be removed. The interests of the general practitioner must be safeguarded and his services utilised whenever possible. Free the whole-time men from outside interference and control, and then the friction now existing between our various branches will disappear.

The present canvassing of owners of tested herds is no doubt directed by one of these outside influences.

Representation has already been made and is receiving consideration in the highest quarters, through a Member of Parliament whom I hope will prove a most useful ally to our Profession, whereby a scheme can be devised to utilise the services of the Veterinary Profession as a whole, to the fullest possible extent. The logical solution appears to be to create a Bureau of Animal Health, putting a member of our Profession at its head, and making him responsible to one Minister only of His Majesty's Government. The Bureau would be staffed by whole-time members of our Profession; we already have sufficient of these men at the Ministry of Agriculture and their salaries can be increased by adding to their duties those of breeding of livestock, which are now carried out by men with no veterinary training and who should be deposed. This Bureau would supervise and direct all veterinary services, and make the fullest possible use of the services of the general practitioner.

The recommendation that candidates for whole-time posts should have a post-graduate diploma may be excellent in conception, but may also be barren in results. Evidence of practical experience should be the criterion, and a suggestion that has been put to me by a neighbouring colleague that those general practitioners who are getting beyond the "hard graft" of general practice might be considered when the question of some of these whole-time appointments arises, seems excellent—the difficulty presented by the existing ban upon the utilisation of their services, owing to age, and the superannuation schemes, should not prove incapable of solution.

The Veterinary Profession must have a fair and full field in which to deal with the question of animal diseases and all matters already outlined: it is fully capable of doing so.

It is quite true, as Mr. Begg states, that whole-time men can advise various bodies, and can act more fearlessly with stockowners than can the general practitioner; but, on the other hand, they have to "watch their step" in their criticisms, while the general practitioner, even if he cannot influence, can become a regular thorn without troubling about a penalty.

Remove outside control, and all branches will

work in harmony. The general practitioner will then have no fear that his interests will be poached upon.

Yours faithfully,
J. F. D. Tutt, f.r.c.v.s.

Winchester.
March 2nd, 1936.

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THE PROSPECTS OF YOUTH

To the Editor of The Veterinary Record

Sir,—As a contemporary of Mr. Chipperfield, whose letter in your issue of February 22nd I read with great interest, I feel impelled both to endorse and to amplify some of the points which he raises.

To the young practitioner and to the student still at college, the mass of correspondence both in this journal and in other quarters, growing steadily both in volume and temperature, cannot be other than depressing. What, as Mr. Chipperfield remarks, are the prospects of this harassed young man? To my mind his choice lies in one of several directions.

He can, after a period of initiation as assistant to a practitioner, embark upon the stormy seas of general practice. Here he will find hard work, little leisure and less money. He will, however, be responsible to nobody but himself for his errors and omissions, and he will be able to exercise to the full the training in all branches of veterinary science which he has received both during his training and after leaving college. If he is of a thrifty disposition he can probably make sufficient money to live a happy, though not luxurious, life. His livelihood will depend on his skill as a veterinary surgeon. He will examine new forms of treatment which may arise and use his own judgment as to their respective merits or demerits.

On the other hand he can, after taking his Diploma and probably a post-graduate degree in addition, paddle gently out on the stagnant waters of a whole-time appointment. Here, if he behaves himself, his salary and his future are assured. He will spend his days in the ordered routine of visits to cowsheds, the palpation of bovine udders, auscultation and percussion, and the deep coolness of the slaughterhouse. His evenings will be occupied with the filling up of innumerable forms and papers, and when he has laid these aside, completed in every detail, he is free. He can enjoy a quiet hand of cards at the Browns', secure that no ill-timed parturition will defeat his call of three spades.

But if this is to be the fate of the young man, why go through a long and somewhat expensive training as a veterinary surgeon? Initiative is stifled. No move must be made without the consent of some higher authority. The greater part of his training is entirely wasted. The absorbingly interesting art of surgery is taken from him. His training in "small-animal practice" is valueless. Far better for him to take his place in an insurance office or bank, where no long training is asked for and school fees are the sole cash outlay. He will have a very similar life to that of the whole-time veterinary surgeon, and his every move will be amply supervised, checked and re-checked.

I have little knowledge of practice abroad, but understand that here the active man may find ample scope.

To the student who has any real affection for his calling, the choice is obvious. It is equally obvious to the "jellyfish" type which will inevitably be attracted to the profession by the scale of salaries and security offered to the whole-time man.

Anyhow, perhaps it does not matter very much which way the straw bends. Judging from the trend of international politics, the younger generation are only to be allowed a few more years in which to bicker and squabble before being silenced for ever by the very latest type of poison gas or noiseless bomb.

Yours faithfully,
H. Lambert Smith.

65, Grosvenor Avenue,
Carshalton,
Surrey,
February 24th, 1936.

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THE INCIDENCE OF BOVINE TUBERCULOSIS

To the Editor of The Veterinary Record

Sir,—Our recent contribution on the above subject has led to the publication of interesting contributions from Major Rabagliati, Mr. Moodie and Mr. Thomas and we would express the hope that others who have similar material available will put it on record. In the course of a few weeks, when we have completed the testing in several further areas, we intend to return to the subject. Meantime there are two points, arising from Mr. Moodie's article, on which we would invite discussion.

Mr. Moodie, too, has observed that the intradermal tuberculin reaction in the young animal is always characterised by a large and very typical swelling and asks, "Has the size of the reaction any relation to the extent of the disease in the reacting animal?" His answer is, "The size of the reaction is in inverse proportion to the extent of the disease in the reacting animal." While we admit the facts on which he bases his opinion, we can recall instances where cows which had shown large typical reaction swellings had quite widespread lesions and contrasting cases where in an almost "doubtful" reactor only a few relatively old lesions were found on *post-mortem* examination. Our limited observations do not support Mr. Moodie's opinion and we would suggest that the large typical swellings are, at least very frequently, indicative of relatively recent infection. Such a view has support in the regularity with which affected young calves show considerable typical swelling after the first intradermal dose of tuberculin. In this connection the experience of those who have found reactors when re-testing "clean" herds would be particularly interesting. We have only a few records of such cases but they do support our contention.

Mr. Moodie has, apparently, read into our reply to a question put during the discussion in the North Wales Division, a meaning we had not intended to convey. We were asked to explain why 16 per cent. of our calves under six months reacted, whereas only 5 per cent. of the older calves gave a positive reaction and if this was because the younger calves during the next few months of their life overcame infection or lost their ability to react. The reply was that the difference was probably quite accidental, that the numbers dealt with were small and it just happened that there were more infected calves in the younger age group. The opinion was expressed that the figures could not be taken to indicate that some calves had overcome infection and lost their ability to react. The wording of this reply in the report has led Mr. Moodie to think that we believe an animal does not "recover" from tuberculosis and to his expressing the opposite view. Mr. Moodie adds: "It is

surely not too much to think that in mild infections the animal eventually recovers." But what is meant by "recovers"? Our colleagues engaged in meat inspection may be able to give the proportion of affected carcases which show nothing other than a few old-standing lesions. Animals so affected might well be regarded as "recovered," but are they reactors? One occasionally hears of instances of loss of ability to react, as in the case quoted by Mr. Moodie, but are they other than rare occurrences?

Yours faithfully,
R. F. Montgomerie.

University College of North Wales,
Memorial Buildings,
Bangor.
March 2nd, 1936.

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ELECTRIC STUNNING

To the Editor of The Veterinary Record

Sir,—It has come to my notice that some have been using for destroying dogs and cats the "Euthanator" invented by Mr. C. R. Golledge, with a transformer which reduces the voltage at the electrodes to less than half that at the electric main.

This concession (of a transformer) has been made for the convenience of the operator and was not included in the method originally endorsed by me when Mr. Golledge was kind enough to give me a demonstration and when we wrote our several contributions on the subject to the veterinary journals and in other papers.

In my opinion it is not certain that a current of less voltage than the usual one of about 200 volts as it comes from the A.C. main will cause that degree of unconsciousness in a dog or other animal which will make its subsequent destruction by knife or prussic acid injection free from inconvenience or distress. It may even intensify the distress. Consequently, I wish to dissociate myself from the method in which such a transformer is used.

When Mr. Golledge gave me the original demonstration the fact which most convinced me of the unconsciousness of the animal was the cessation of the heart's action for several seconds during which time no oxygenation of the brain was possible, so that there could be no feeling while the progressive effect of a powerful electric current was being exerted, and the prussic acid was being injected. I find it hard to believe that any degree of electric stunning less than that which will arrest the action of the heart for some seconds can, unless long maintained, be relied upon as an anæsthetic in the humane killing of animals.

Yours faithfully,
Wakefield Rainey.

The James Bay Hotel, Ltd.,
Government Street,
Victoria, B.C.

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SIR. F. HOBDAY PORTRAIT FUND

To the Editor of The Veterinary Record

Sir,—The response to our first announcement, in *The Veterinary Record*, of the inauguration of this fund, has been gratifying. As was then stated, a few veterinarians instituted this fund in order to present to Sir Frederick his portrait in oils. It is hoped that eventually this portrait, or a suitable copy, will grace the great assembly hall of the new College at Camden Town, the erection of which was so very largely made possible only by his indefatigable efforts. Several members of the profession have suggested that it would be a convenience if the Hon. Treasurer's address were published. Donations should be forwarded to Hamilton Kirk, 658, Finchley Road, London, N.W.11, who will officially acknowledge them. The fund now totals £40, and following is a list of donators to date:—

Nairn, W.	Haselden, C. S.
Bullen, R. E.	Green, D.
Fowle, W.	Male, G. P.
Golledge, L.	Payne, A.
Hammond, J.	Ede, H.
Willett, R.	Pillers, A. N.
Willett, F.	Jelbart, E.
Kirk, H.	Elmes, Geo.
McCunn, J.	Andrew & Son, A. H.
Ward, J. F.	Somer, F.
King, H. A.	Macdonald, J. F.
Eardley, F. J.	Sutton, G.
Tomlin, G. A.	Stainton, H.
Dunn, H. S.	Ollerhead, K.
Miller, T.	Hopson, C. G.
Wilson, T.	Cautley, P. J.
Bloxsome, G.	Kelly, L. J.
Pugh, L. P.	Cornish-Bowden, A.
Chambers, F.	Hodgman, S. F. J.
Jack, D. S.	Wood, E. F.
Brekke, H. W.	Standley, H. P.
Bodger, H. W. Steele	

Yours faithfully,
H. Scott Dunn.
H. Kirk.
J. McCunn.
W. C. Miller.

R.C.V.S. COUNCIL ELECTION

To Fellows and Members of The Royal College of Veterinary Surgeons

Gentlemen,

I have agreed to stand as a candidate for election to the Council of The Royal College of Veterinary Surgeons, and in asking you for support it is essential that I should lay my views before you.

I am directing my appeal in particular to those of you who like myself are engaged in general practice, and who have been rightly termed the back-bone of the profession. As one who has spent his life in practice I am only too well aware of our difficulties and the fact that our interests are not being safe-guarded.

I hold a perfectly open mind with regard to the work which is carried out by whole-time Veterinary Officers, but in too many instances they are exceeding the duties for which they were originally appointed, and are definitely encroaching on to the field of general practice. Their duties should be confined to the control of the scheduled diseases and matters relating to public health. The position of the various Veterinary Advisory Officers requires urgent revision. Equipped with laboratories and stationed at convenient places throughout the country they would be a distinct asset to our profession, but at present they are under outside control and are being sent into districts often without the knowledge or collaboration of the local practitioners, this leading to much ill feeling.

By adopting this small general outline as a basis of future policy, that closer co-operation so earnestly desired will be assured between the various branches of our profession.

Yours sincerely,
J. F. Donald Tutt, F.R.C.V.S.

1, St. Cross Road,
Winchester.